supplies us with examples of what is most striking in Italian art for breadth and boldness of handling. What would Raffaelle not have given for the power to paint a panel in majolica! A salamander, heated with gas, places that process within the reach of art.

PUBLIC MORTUARIES FOR LARGE TOWNS.

At a recent meeting of the Royal Institute of British Architects, a paper on Public Mortuaries, so called, was read by Dr. Hardwicke, part of which we may usefully print to carry on the subject long treated of in these pages. The *Builder* has been in advance of the public on this matter, and it is perhaps not too much to say that the descriptions we have printed at different times, of the effects produced by the want of a suitable place to deposit a body before burial, and the views we published, showing from actual observation the rooms of the poor when a death takes place in the family,—the dead among the living,—have had something to do in bringing about the present state of public opinion in favour of providing such places of reception. We take that part of the paper which refers to the sort of building that should be erected:—

"We now arrive at this point—what should be the essential features of a public mortuary, and what the kind of building best adapted for it?

In any plan that may be proposed, two distinct apartments must be provided.

First. The place for the reception of bodies *uncoffined* and brought in, when found dead by the police, or by the coroner's officer or constable, or by the relieving officer; bodies having to await identification, or a coroner's inquest; here also would have to be deposited bodies removed by order of the coroner, or of a medical man, for the purpose of *post mortem* examinations; or of persons having died from a dangerous contagious malady, and rendering immediate [illegible] necessary. This would be the dead-[illegible] *mortem* examination [illegible] ought to have [illegible] for *post* good ventilation, a supply [illegible] ve, deodorising and disinfecting agents, a marble or slate slab with sloping inclination towards the middle, and a fall for drainage into a pail or a trapped sink. On two sides of the room marble slabs, 2 ft. wide at least, ought to be placed for bodies to lie on. Here bodies may have to await the undertaker to place them in shells or coffins, and afterwards to remove them to the mortuary. Spare shells or coffins should be at hand on a shelf for any sudden emergency.

Second. The mortuary proper should be a large building capable of receiving ten or twelve bodies in shells or coffins, to be placed on trestles or a centre slab (to be regulated by the requirements of the town where situated), here to await interment. In Clerkenwell, iron moveable brackets are used for coffins to be placed upon, and when not in use they fall back. Catacombs, or cells in slate or brickwork may be proposed, if desirable, and the body might be closed and locked up until removal. The relatives would come here to inspect the coffins, and the funeral might start from the place.

This building must have some pretensions to ecclesiastical and ornamental architecture both externally and internally, and any attempt to associate it with the idea of its management being concerned with the parish or with poor relief ought to be most strenuously avoided. I am not aware that any plans have as yet been offered on approval better than those furnished to illustrate my remarks.

This most important point connected with public mortuaries must not be forgotten, viz., the removal of the idea that the institution is a parish dead-house; otherwise respectable persons will not be persuaded to allow their deceased relatives to be removed to it. When that is accomplished, and persons have a conviction that an air of sanctity and security is maintained, the first difficulty in overcoming any prejudices against public mortuaries will be removed.

The object will be gained by attention to two things:—

First. The efficient management by a competent sexton.

A public mortuary should be provided with a resident attendant, whose duty should be at all times to receive under his charge bodies brought to him by the police, or by the coroner's constable, or by order from a duly qualified medical man; and that the bodies of persons brought by relatives or friends, who guarantee the expenses of interment and removal under fixed rules, be signed by them; also that he receive the bodies of persons found dead and who are unknown. The attendant should be responsible for the proper cleansing, disinfecting, and ventilating the rooms generally, and particularly that used for *post mortem* examinations.

He should be required to keep a mortuary register, in which should be entered the name and other particulars of persons brought in, the names and conditions of the persons who are responsible for the removal and for the expenses of the interment of the body deposited; and that a register be kept of the house and place of removal, and of the manner in which the removal has been effected.

He should be also required to give notice at the police station, or to the coroner's constable, when a body has been admitted which is unknown, as well as to the parish authorities, and undertaker, and contractor for the burial of the bodies not claimed or known, and also to the persons who have to remove or bury after a coroner's inquest or otherwise. The public should have free access at certain hours either to visit or view the bodies of the persons deposited, or for the identification of bodies found dead and unknown. (In the plans submitted herewith most of them provided accommodation for coroner and jury, as well as a post-mortem room.) In certain hospitals, lunatic asylums, and many London parishes, the custom of a coroner and jury going to a public-house to hold an inquest is rendered unnecessary; for a suitable room is provided by the authorities, and a degree of dignity is thus attached to the proceedings, which it is almost hopeless to expect to be the case amidst the din and bustle of a tavern. The Middlesex and University College Hospitals, the Royal Free Hospital, Gray's-inn-road, and the Marylebone and Holborn Boards of Guardians, may be mentioned as instances where the inquests are permitted to be held in a board-room.

Secondly. The choice [illegible] situation is of importance.

In the metropolis an[illegible] large towns a very general approval [illegible]n, that the old [illegible]est site is that of a generally [illegible]round or situation [illegible]. Objectionable site could scarcely be named. In the parish of Marylebone a faculty has been obtained, enabling the vestry to construct a mortuary in a disused burying-ground, and after an inspection of the plans the rector, the Rev. C. I. P. Eyre, though at first opposed to the proposal, was so much struck with the proposed improvement, that he has given his cordial adhesion to it. The Marylebone structure is very simple, but I am afraid not altogether adapted for its purpose.

It would be also much in keeping with these unused burying-grounds if the walks were well attended to, if they were tastefully planted with evergreens and ornamental gardening, and in shady places seats might be placed for the accommodation of persons who would be glad of a retired and quiet place within easy distance of their dwellings. The residence of the keeper might be at a lodge in the entrance, or as near as possible to the mortuary itself. The cost of these buildings and the mode of raising funds for their erection and maintenance ought not to present any great difficulties with municipal authorities.

The law gives authority to Local Boards of Health, and the Burial Acts have likewise power to levy and appropriate funds for the purpose here indicated.* The estimate for the building or site will of course vary according to the special circumstances of each case, but from the experience of what has been done already it may be stated that an outlay of from 300*l.* to 1,000*l.* would be the amount likely to be required. Mr. Hutchinson, the Mayor of Liverpool, gave 1,000*l.* for the erection of a public mortuary.

In connexion with this subject it may be mentioned that a hand-hearse or fever ambulance might be kept in a shed attached to the mortuary: thus the difficulty now experienced as to where to keep those vehicles, owing to their objectionable character, would also be avoided. Disinfectants might be stored or kept here, and the person in charge should be required to possess a knowledge of Stenhouse's method of using dry charcoal for deodorisation, or other means for making the room and coffins fit for view by those who have to enter, and thus the mortuary would do away with the annoyance and disgust now existing amongst jurymen and others in having to visit the parish dead-house in pursuance of their public duty.

* Burial Acts, 15 & 16 Vict., cap. 85, secs. 41, 42.

A plan and section for an inexpensive kind of mortuary will be found in our volume for 1867.* It would be desirable, however, to make the building somewhat more dignified and impressive to aid in removing prejudices against its use which still exist. The term "mortuary," to which we took a certain amount of objection in earlier days, has not yet been superseded by a better name. "The Grave House" occurs to us as a substitute, but we are not quite satisfied with it. One objection to "mortuary" is that the word already exists in the language with an entirely different meaning. A mortuary in law is a gift due to and claimed by the minister in many parishes on the death of a parishioner. The meaning of the word, however, in its new application would soon become generally known, and indeed it is already so widely adopted that probably we cannot do better than retain it. So that we get the thing, we will not quarrel about the word.

THE LIVERPOOL CHAPEL ACCIDENT.

INGRESS AND EGRESS.

The recent melancholy accident at a Roman Catholic chapel in Liverpool, in which seventeen persons lost their lives through being crushed among a panic-stricken crowd fighting for escape at the door, is one more proof of the importance,—say rather, the absolute necessity,—of providing adequate means of egress from all buildings intended to accommodate a large concourse of persons; and this, not only with regard to the mere width of the doorways, but with regard also to their situation with reference to each other and to the building, and the means of approach to them from within. Looking at the spot on which the accident happened, it is difficult to say how it could have been better contrived to produce the fatal result which it did, given the circumstance of a panic taking place among those present. At the north-west corner of the chapel a wooden framed partition shuts off a flight of eight steps, between 5 ft. and 6 ft. wide, leading down (at right angles to the length of the [illegible] building) to a narrow landing. The door at the top of the [illegible] is about 5 ft. wide, street-door at the bottom only about 4 ft.—a palpable mistake, as the difference in width, if any, should be the other way. On the left of the landing (coming out of the chapel), close to the street-door, opens another door, 2 ft. 10 in. wide, admitting the occupiers of the school-room from below on to a landing, already rather small, if it were for the use of the chapel only, to pass out through the same street-door as is provided for those coming down from the chapel. The result of a panic will be at once perceived: a crowd would be precipitated through the wide door at the top of the steps down on to the landing, there to find a second column fighting its way up through the door on the left of the landing. There are other doors from the chapel, but these open into a passage at the east end, involving a turn at a right angle to get to the street-door at the end of the passage, and the door at the west end was probably that most used by the congregation, and to which the majority of them would naturally turn.† This inner door at the top of the steps, before referred to, is a single wide door, opening back against the wall inwards, which is a bad principle for a door in such a position; for if a crowd got up to such a door from within whilst it was still closed, it would be almost impossible to open it at all. With regard to the recent accident, it would have been better could it not have been opened, as the crowd would then have been divided; but, as a rule, all internal doors in such a position should be hung folding, and to open either way.

How to deal with the outer door is a more difficult question; but it appears to us that sliding doors might be much more largely used than they are. They would look better, and be more out of the way on ordinary occasions than a heavy hinged door, and in case of a sudden rush outwards there would be no danger of the passage being blocked by pressure against the door.

The moral which this accident teaches, with

* Vol. xxv., p. 424.

† We did not find the large doors, opening outwards, mentioned in our paragraph last week: our informant must have been misled.

regard to provision of exit from buildings, however, is two-fold—1st, never to turn two streams of people through one door, but to provide always separate means of exit from galleries above or from a room below; and 2nd, not to rely on extra doors to be used only in case of a sudden rush. A congregation in a panic means a congregation of people who have temporarily lost their head, their judgment, and their recollection: they will infallibly make for the most usual exit to which habit has accustomed them, and therefore the care of the architect must be to provide that the usual means of exit shall be sufficient for exceptional cases, and that doors shall be easily reached without going through a tortuous and angular course to get at them; and, moreover, that always the series of doors to be traversed should widen as the street is approached, so that the crowd may not be sent in numbers through a wide inner door to find themselves blocked by a narrow external one.

Coming away from our visit to the scene of the accident, we observed in the neighbourhood another building advancing towards completion, St. Stephen's Church and Schools, which also consists of a church over and school-room below; and here again the steps from the church are brought down into the same porch which gives egress from the school-room, landing close to the door of the latter. The doors are wider and better placed than in the chapel in Grosvenor-street, but if the school-room and church should ever be used at the same time, a repetition of the Grosvenor-street calamity, not perhaps in so aggravated a form, might still be possible; not to speak of the every-day inconvenience attendant on such a plan.

In speaking on the subject of panics, it is impossible to avoid a comment on the insane folly and absurdity (to give it no worse a name) of persons who make it their business to raise the cry of "Fire!" in a building at every small disturbance, even such as the unexpected flare-up of a gas-jet. It has not been discovered with whom in this case the fatal cry originated; we more than suspect that, if not in this, at all events in some similar cases, it has been raised from mere wantonness, and in a spirit of mischief,—a proceeding which amounts to criminality; and even if otherwise, the practice exhibits a degree of folly which, for the sake of the public, ought to be treated as if it were criminal. If it were understood that a summary application of Lynch law would be visited at once on the head of every man calling out "Fire!" in the midst of a crowded assembly, we should be saved a good many of such disastrous occurrences as that on which we have been commenting. In the meantime let sensible people remember that when a panic occurs in a crowded building, from whatever cause, in nineteen cases out of twenty the safest thing they can do is to sit perfectly still.

THE GREEK CHURCH AT LIVERPOOL.

THE erection of a large church, reproducing, almost in its integrity, a style so exceptional in itself, and so far removed from us geographically and chronologically, as the Byzantine, is an event of some architectural, or perhaps we ought rather to say archæological, interest. In this case, indeed, archæology is predominant in a special degree; as the new church for the Greek community in Liverpool is not merely based in general design on the Byzantine style, but is, with but slight variations, an actual and premeditated copy of one particular example, viz., the church of the *Theotokos* at Constantinople, figured in the "Handbook of Architecture," by Mr. Fergusson, whose laudation of the design as a complete model of Byzantine architecture has been, if we are not misinformed, the chief ground for its adoption and imitation in the present case. Those of our readers, therefore, who like to turn to page 956 of the "Handbook," will have at once a general idea of the building we are commenting upon. The principal differences are, that the new church is more than half as large again as its original, and the plan has been simplified by the omission of the inner narthex, or rather by throwing this into the church; and in the west elevation the lower windows have been divided and spaced, so as to coincide in their centres with the large semicircular windows above, which is a manifest improvement. At the east end the smaller apses are externally marked in the manner peculiar to the style, by a sinking in the wall at each side, arched over above so as to cause the outline of the apse to die away into the main wall-plane. The central apse has a series of narrow windows with the corrupt quasi-classic columns and capitals with which students of Byzantine architecture are familiar; the round-arched window-heads above being stilted so as to bring the springing of the arch about twice or three times the diameter of the window above the cap of the column; an ugly and disproportioned feature to which no considerations of archæology can reconcile us. The building has, like its prototype, four domes; the principal one over the crossing in the centre of the church, and three smaller ones over the centre, and each extremity of the narthex; the varied outline of these domes in the original building has been faithfully preserved in the copy. The main portion of the church is very solidly and well built in red brick, alternated with courses of light-coloured stone, on a rusticated and slightly battered base of similar stone. The whole of this brickwork and masonry is very well executed; the working of the archivolts of the niches (semicircular on plan), on the south and north sides, with alternate voussoirs of stone and brick, is a very neat piece of workmanship. The heavy granite shafts to the windows on the west front, and the deep reveal behind them, combine to give an expression of architectural dignity and solidity to this portion of the building. Internally, the effect is disappointing. The dome rising in the centre of the area, and the cylindrical vault carried on marble columns, with no timber construction visible to mar the unity of expression, seem to furnish a basis of a fine and truly architectural effect. But the life of Byzantine architecture lies so much in coloured decoration internally, that the sight of a blank expanse of plaster on wall and roof (intended, we presume, to be ultimately decorated in colour) strikes the eye as singularly cold and uninteresting in appearance; and the general bare, white appearance of the whole is not even broken by the columns, which are of white veined Carrara marble, with capitals of the same, the small amount of differently-tinted marble in the plinth and base being nearly lost sight of amid the furniture of the church. Whenever the church is coloured internally, we doubt whether these same white columns will not have a bad effect in another way, as contrasting too hardly with the decoration, unless the latter is of a far more delicate and low scale of colour than Oriental taste in general affects. In short, we incline to think that supporting columns of white marble, on a large scale, are an expensive mistake with regard to architectural effect. In strong contrast to the white walls is a coloured-glass border round each of the windows, in strong, harsh colours, and in a commonplace type of design, which ought never to have been admitted into the building. Across the east side of the transept stretches the usual *iconostasis*, or frame for the sacred paintings. This is of oak and walnut, elaborately carved, and apparently, as well as the other woodwork of the church, a very good specimen of the joiner's craft and the carver's art; but as we could obtain no permission to inspect the church, except during service-time, and even then did not contrive to effect an entrance without some opposition on the part of "a doorkeeper" in this "house of the Lord" (not after the model of David), our investigations were somewhat circumscribed, and we can only speak generally on this head. The carving of the capitals of the main columns, as well as the ornament on the architrave and capitals adjoining the west entrance, is all in the flat incised style proper to Byzantine architecture, and is mostly admirable both in design and execution. The three domes over the narthex do not come prominently into the internal composition; the centre one lights the women's gallery, which is over the narthex and projecting a little into the church; the dome on the south lights a staircase to this gallery, and that on the north a room for meeting in connexion with the church. The whole of the vaulting is, we understand, of 14-in. brickwork, with wooden roofing on the exterior.

Looking at this church as a specimen of Byzantine architecture let down into a Northern climate and in the midst of a modern town, it is impossible to feel that the experiment, so far at least as external architectural effect is concerned, is a satisfactory one, or one which we should wish to see repeated. Unquestionably the style is a fine one for internal effect, which, however, for the reasons given above, has not in this instance been fully realised as yet. But when Mr. Fergusson says, speaking of the original building, that "there is nothing here that could not be practised on a larger scale, and that would not be improved by being so used," we must say that on the contemplation of an actual example (with some improvements) on a larger scale, we feel inclined to differ from him. The peculiar form of dome, springing apparently from a series of light semicircular external arches, must become unsatisfactory, because not giving the appearance of constructive stability, as the scale is enlarged; and in looking even at the moderate-sized cupolas of the Liverpool church, one feels the wish for an assurance that they are adequately tied at the springing. Then the picturesqueness of effect which such a grouping and outline would have on a small scale, becomes when enlarged somewhat *bizarre* and barbaric in appearance; and as the centre dome is not sufficiently large and important by comparison to dominate the others and give unity to the composition, the whole assumes a somewhat scattered and purposeless expression; and, when viewed from the west end, the predominance of the narthex, with its three domes stretching across the front, quite eclipses the rest of the composition, reducing what should be the prominent feature to a secondary position, and exaggerating the shortness and squareness of the plan. Then again, whatever scope for effect there is in an interior of this description, lighted almost entirely from above, there is surely no known case in which ritualistic requirements have interfered more wofully with architectural effect than in the placing of the high *iconostasis* as a screen right across the building, shutting out the termination of the vista, and interposing a horizontal bar across the perspective. The organ-screens, complained of in our English cathedrals, are a trifle to this.

Placed in a modern English town, a building like this appears, externally at least, very much of an architectural deformity; only consistent in that it represents alike the past and present of a Church which (if we may take Dean Stanley's authority) is even more conservative than her rival seated (at present) somewhat uncomfortably on the Seven Hills.

To what architect the credit of the church is due is, as Falstaff says, "a question to be asked," as there are two Richmonds in the field; Mr. Sumner having been understood till recently to be the architect, and Messrs. W. & J. Hay having claimed the merit of making the original plans. Perhaps some of our readers will concur in thinking that the spectacle of two clever English architects of the nineteenth century disputing the credit of a building which is admitted to be a mere reproduction of an Oriental work of the tenth century, is somewhat singular. It is not our intention to take up the cudgels for either side; but we may observe that while no one who is acquainted with the other buildings by Mr. Sumner in the neighbourhood will suppose that he has any need to purloin details from any other architect, it does appear on the face of Messrs. Hay's letter that they originated the suggestion of adopting the *Theotokos* church, and had made plans for the purpose, which their client had in his possession for some months after he had, for whatever reason, declined their further assistance, and called in Mr. Sumner to his aid; and under these circumstances, it seems natural they should think that their name ought to have been mentioned. A further complication is that the client aforesaid, a leading member of the Greek congregation, put forth his claim also, in a letter which did not argue much for his acquaintance with the subject, to the whole credit of the originating and carrying out of the scheme. On this point we will merely say that most architects of any professional experience will have had the opportunity of knowing on what kind of grounds such claims are sometimes set up by clients, and what degree of credit need be given to them.

Iron Casements and Frames.—In the new building for the society of the Inner Temple, of which we gave illustrations and particulars quite recently, the patent wrought-iron water-tight casements and frames made by Messrs. Burt & Potts are used somewhat largely, and the makers naturally enough wish this to be known. We have lately met with Messrs. Burt & Potts's casements in several buildings, and find they keep a good character for excluding wet and wind. They are strong without being heavy in appearance.

A DAY AT DORKING.

WHAT'S to be seen at Dorking? Not much that would prove very interesting to the antiquity hunter, or even the geologist. The botanist might pick up a few trifles on the hills and low-lands, and the artist would surely find a dilapidated cottage and a stricken tree by its mill-stream for his "study from nature." But though Dorking is destitute of any important historical interest to-day, yet it presents a fresh field for the operation of the philanthropist and the social and sanitary reformer. In fact, Dorking is a die-away place, with a mildew upon it. If ever a town got the rheumatism, and presented an aching appearance in its body, limbs, and joints, that town is Dorking. There are towns uglier, dirtier, and more pretentious, but few of its size possessing less animation or public spirit. The worthy townsmen and shopkeepers, small blame to them, think their native place the paragon of fashion and the very pink of perfection; and, conscious as they are that they have beaten the world in poultry, they are quite indifferent as to what the outer world may say of their town. Pshaw! Cambridge may gabble about its geese, Norfolk boast of its turkeys, Aylesbury vaunt of its ducks, but Dorking is, *par excellence*, the cock-of-the-walk for roosters! The Dorking folk need only to remind their critics of what they did at the Crystal Palace a short time since, and so silence them.

But to the point. Dorking, as reached from the South-Eastern Railway Station, is very badly accommodated; in fact, both lines do not come much nearer than half a mile to the centre of the town, and the approaches from the railway station are not the most pleasant, either for the visitor or the inhabitant, particularly at night-time. Why such a stupid arrangement was carried out originally we know not; but the fact is apparent that a remedy will have to be, sooner or later, applied, for the town undoubtedly suffers in business on this account. In passing up the High-street,—the main thoroughfare of the town,—it struck us that, by removing two or three of the old structures in the centre of the street, on the right, a new road could be carried over the mill-stream to the railway, which would greatly facilitate the ingress and egress to and from the town. Nothing could be more awkward and disagreeable than the present approach.

As to the sanitary condition of Dorking, we may be allowed to say that the sooner a new leaf is turned over on its account the better. It has not yet been placed under the Local Government Act, and whatever is done in the way of cleansing or in repairing the roads at present, it is by the Highway Board.

The great majority of the Dorking folk have set their faces against the formation of a Local Board of Health. They do not understand why such a thing is wanted at all in the town, except (as one of them said) to create offices for place-hunters and crush the people by a system of unlimited taxation. We spoke to a few worthies in the town, who seemed to take a pride in the opposition that they gave to the "place-hunters," and who were jubilant in the idea that they had smashed the egg of the incipient board, and destroyed all hopes of an animated chick. In this opinion we opine they are mistaken.

It is strange, but nevertheless a fact, that those who have been loudest in protesting recently in the town against the formation of a local Board were some landlords, who alleged as a reason for their "disinterested" opposition that it would lead to an increased taxation on the back of those who are ill able to bear it; and yet these same landlords were the very first to belie their principles by raising the rents of their tenants.

The poor want cleanliness and comfort, and the town requires better kept roads and foot-paths, and a proper system of drainage and sewerage. The town also wants to be better lighted.

The main portion of the sewage of Dorking finds an outfall, or rather many outfalls, in a rivulet called the Mill-stream; but where the foulness ends, and where the polluted water eventually empties itself, we do not know.

The sewage of Dorking could be utilised with very little cost, and be turned to a source of profit. The supply would never equal the demand; so the Dorking people need not fear, as they do, that if a proper system of drainage were carried out they would not know what to do with their surplus sewage. To get over the impending evil, they allow it to sink in and sodden the soil of the town, save that small portion which, after many devious windings, discharges here and there in the unsavoury Mill-stream.

Talking of the establishment of a local board, we asked one of the opponents what they meant to do with the sewage of the town. "Oh," said he, rather puzzled, "that will be an after-consideration. You see, sir, we were not going to be gammoned by those new-fledged humbugs."

Another Dorking native, who was probably never out of his own shire, pointed with an air of triumph to the failure of "the scheme" of boards as carried out in Epsom, Guildford, and Reigate. See what they have done for themselves in those places. Just look at Epsom and Reigate. They told the people in Epsom that the rate would only amount to three shillings in the pound, and that every year there would be a reduction; but it was found out soon that the three shillings related to the quarter and not to the year. "We are not," said our indignant informant, "going to be saddled with twelve shillings in the pound."

We doubted our friend's figures; but "he knew better." So we left it so.

Sanitary education, as well as scholastic, must be made compulsory. Some men refuse to wash their faces or shave; other folk will not clean their dwellings or change their linen; but if eccentric dirty people like to indulge their nasty whims by living in a state of "dry rot," that is no reason why a public plague should be let germinate outside of doors, by not attending to the streets, lanes, and drainage of the town.

The Dorking folk have a proverbial saying that "a shower of rain cleans the town." We witnessed an illustration of this wise saw, on the inverse principle, on the occasion of our visit. A few hours of a good rainpour would undoubtedly freshen the side channels of the streets, and wash the flags, and flush the sinks where it would not have the effect of choking them: the latter is the most common.

In Back-lane, there is no footpath properly speaking, and the open sinks in the locality, as well as the "stopping-place," is in a very wretched condition. The latter is choked up with filth, and is apparently overlooked altogether, though of recent construction. In Mill-lane the houses of the poor are small, dingy, and dilapidated-looking structures. The poor dwellers keep them tolerably clean; but in summer weather the smell must be most offensive, owing to the fact that the privies are almost upon the kitchen floor, or, in other words, they are placed in a passage between the entrance-doors of both houses, the said opening being hardly sufficient for the free passage of even one person. The poor occupants of these very old structures, half wood, and half rubbish, pay 3s. a week, and are glad to have them even at that price, as house accommodation for the poor is insufficient in Dorking. The Mill-lane is not over clean, and it can hardly be so from the construction of the dwellings, and the nature of the open sinks in the lane.

On the Frankford-road are a series of ill-constructed houses, miscalled Model Lodging-houses. They were not built to last, and the floors and walls will part company some future day, not far distant. They were built by a speculative tradesman of the town, who commenced their erection five or six years since. They were grasped at eagerly by the very poor from their cheapness. They are two stories high, and are built of loose stone, brick, and other rubbish. They contain about seven rooms, and they are rented at about 5s. 6d. per week. To pay this rent, those who take them have to sublet them to others; and so a house that is only intended for one comfortable family, is made to accommodate three or four, with the consequent bad result. The owner has not given them a rub of paint externally or internally, or a coat of whitewash, since their erection. The original priming colour is still to be seen on the window-sashes and some of the doors. Yet he is blessed by some of the inmates for enabling them to have a cheap shelter. The yards belonging to these so-called Model Lodging-houses are in a very bad condition, and the kitchens are dismally dark and damp. The sinks are within the kitchens; and even on the same cold earthen floor some of the poor dwellers can lie down, and feel cheerful that they have a home.

In West-street, on a plot of ground called West-square, beside the National Schools, are Model Lodging-houses of another and better description than the former, but these are not taken to by the poor, and do not meet their pocket. These Model Lodgings comprise a large block of buildings of four floors, each containing many rooms. The rent and conditions have the effect of keeping them partly unoccupied. For one room 2s. 6d. is charged; for two, 4s. 6d.; and a sort of Malthusian doctrine is carried out that only a certain number of children is allowed to the occupier of one or more rooms; doubtless with good intention, but the scheme cannot be "squared."

On the Horsham-road is situated the Dorking Union, a red-brick building, with its wings. The union is reported to be in a good sanitary condition, as appears by a notice entered in the visitors' book by one of the Commissioners in Lunacy.

In the matter of local trade and manufacture the town of Dorking has none of any account. There is a candle manufactory in the town, which employs a few hands; but the labouring population are mostly employed on the land in the environs of the town.

House building at present in Dorking is *nil* almost, and we scarcely noticed anything worth detailing in that line. There is one quarry worked, from which a sort of grey freestone is raised, which is used locally for building purposes, and a chalk stratum is to hand for its ordinary uses, as every one knows. Some very nice villas are out and about the town; many of them neat and not a few fantastical, and pleasant walks and gentlemen's seats are within short distance. Through the town itself the houses are of all features and patterns. Old timber houses, cage-work structures, coated with plaster, dashed, distempered, and tabooed, many of which have long since outgrown the recollection of that very ancient personage, "the oldest inhabitant;" hotels, ancient inns, and hostelries of the old pattern, where the jog-trot carman was wont to stop of old, and where "entertainment for man and beast" was provided.

Except on market day, which is Thursday, the ancient town of Dorking is coldly quiet and naturally dull, and, save on market day, the visitor will not be gratified with a sight of Dorking's pride,—her poultry. In the distance it may be supposed that the poor of Dorking are engaged in rearing this kind of fowl, but people will, no doubt, be surprised to learn that the struggling poor of the town of Dorking are as little engaged in the rearing of poultry, or a great deal less, than in less talked-of places. To rear fowl requires means, room, and open spaces; but we regret to say that the poor of Dorking have scarcely spare room enough to move and breathe in.

The parish church of Dorking is not a very old structure, and as an ecclesiastical edifice, its Gothic deserves no praise. It has one of the tapering weather-vanes description of steeples, covered with lead, we believe. It has also a clock, but what the walls are composed of one can scarcely tell, as a coating of grey cement envelopes the outside. A chancel of a better style, free of a cement coating, was added about two years since.

The fittings within the church are very good. Around the side walls are several tablets to the memory of local gentry, but none deserving any particular notice here. Inside the entrance porch, to the left of the doorway, inserted in the front wall, is a tablet to the memory of the Right Hon. George William Earl of Rothes, Baron Leslie, one of the sixteen representative peers of Scotland, who died on the 11th of February, 1817. Over the staircase, on the right, is another tablet to the memory of Catherine, wife of Henry Talbot, daughter of Sir Hugh Clopton, of Stratford-upon-Avon, who died on the 15th of May, 1754.

These Talbots turn up in a variety of strange nooks and places in the three kingdoms. We have found traces of them north and south of England, east and west of Ireland, and on the Continent.

In the churchyard there are but few tombstones or monuments dating back a century and a half. If there are any older no inscription visible tells us of it.

Reverting to what we have written at the beginning: until the railway accommodation is more perfect, and the town is brushed up by some active local management, Dorking will not progress. At present she is thankful for small favours in her present stagnant state of business. Even a stiff gale of wind is a "god-send" to her idle tradesmen, and her representatives are found thanking Providence that "it is an ill wind that blows nobody good."

The gale that does do good in Dorking at

present is that which unroofs houses, blows down chimney-stacks, tumbles walls, and shatters window-sashes. Such a gale came lately as a New Year's gift to Dorking, and her unemployed were truly thankful.

What more need we write to give the reader an idea of the famous poultry town of Dorking? If it will not be improved internally, we must point out that there are Acts that can be put into motion, and that it is better to do things necessary with a free will than to be made to work against the grain.

We wish Dorking, however, better than it wishes itself, and would be glad to assist it from out the rut by a few kindly words and advice well meant and civilly tendered. We might and could write more of the shortcomings and wants of the town, but sufficient for the day is the evil thereof, and glad shall we be to find that not wholly in vain have we spent a morning in Dorking.

ARCHITECTURAL EFFECTS OF DETAILS.

LIVERPOOL ARCHITECTURAL SOCIETY.

At the last meeting of this society on the 26th ult., Mr. G. H. Ridsdale read a paper entitled "Notes on some Architectural Effects of Proportion and Detail." With regard to the question of style, he thought that a style which had been previously very perfectly worked up, as the English Geometric Decorated for instance, could not well be adopted as a starting-point by modern architects; and that the Early French Gothic, which had recently been so much taken up, offered a good starting-point, as combining great nobleness of proportion with a certain primitive character of detail which left much scope for further development. After remarking on the important effect that site and surrounding scenery should have in determining the character of a design, instancing as examples the harmony which existed between the Scotch Baronial Gothic and the wild country in which it first arose, and, on the other hand, between the Decorated, with its smaller refined detail and the quiet beauty of English landscape, he made some observations on the treatment of towers and spires. These features, when erected in towns amid crowded buildings, would bear much more elaboration of detail and variety of outline than would be desirable in rural sites. The most important portion of a tower was the upper stage; if this were well treated, it was often best to leave the intermediate portion between this and the base as plain and simple as possible. The English towers of the Decorated Period he considered the most successful as designs, owing especially to the graduated outline of their buttresses, but also to the refinement and effectiveness of the mouldings and details peculiar to this style. He ventured to say that architectural designing had never been so pleasant to modern architects, as when, fifteen years ago, this style was in fashion, and hoped that more of, at least, the feeling of this style would be introduced into our modern buildings again, and that the satirical description in the *Builder*, "How John the Son of Smythe decorated the House of the Lord," would soon be less true than it was when it was written. The east, west, and transept ends of the churches formed a peculiarly interesting field for study and design. It would be found a good and instructive study to try the effect of various arrangements of doors and windows in an assumed gable front of some special proportion. Much of the effect of a design depended also upon the proportion and treatment of its secondary features, wherein either picturesque variety might be aimed at, or that dignity of effect which arises from a repetition of the same details in an unbroken series,—a source of effect of the highest and most dignified kind, but more suitable to large than to small edifices. One of the most retrograde movements ever made in architecture had been the recent adoption in so many cases of the cruder early forms of plate tracery, which would have no recommendation but that of variety, after trying all other forms. The constant striving after something new by modern architects, instead of adhering to some one type of detail and composition, and refining upon it until it was perfected, was much to be deprecated. The efforts of architectural students had been devoted lately to learning all the various forms of their art; it was time now to make this knowledge of styles and detail available by blending them into a modern style, realising Wotton's essentials of architecture, "commodity, firmness, and delight."

SANITARY MATTERS.

THE statistics of the last year's proceedings at Barking with the sewage irrigation crops have been completed by the Hon. H. W. Petre, in a pamphlet titled "Notes for the Year ending 31st of August, 1869, upon the Sewage Cultivation of Lodge Farm, Barking" (Wilson, Royal Exchange). Mr. Petre thus reviews the progress of sewage cultivation during the last three years, in which period this farm has been under the system:—

"In the spring of 1866, Lodge Farm, consisting of 218 acres, was obtained by the Metropolis Sewage and Essex Reclamation Company, and was placed under the charge of Mr. J. C. Morton, by whom one quarter of its area was laid out and prepared for sewage cultivation. From twenty to thirty acres were sown with rye-grass in the early autumn, but no sewage was delivered on the farm until October; the sowing was continued, and in the spring an area of about fifty-five acres was ready for cutting and yielded some heavy crops. With the exception of a few rods of wheat, and about half an acre of mangold, no other crops than rye-grass were that year treated with sewage. . . . . In September, 1867, Mr. Morton having been appointed a member of the Rivers Pollution Commission, I undertook the immediate superintendence of the operations on Lodge Farm. . . . . Three or four years ago the universal opinion was that town sewage could be utilised only on the growth of grass, and was wholly inapplicable to grain crops. It is now proved beyond a doubt that all ordinary farm and market-garden crops can be abundantly produced by the use of town sewage alone, and that wheat, mangold, and cabbage flourish alike under its application; and I much doubt if in the end it does not prove that such crops will be grown with greater profit than rye-grass when a specific value is placed on the sewage."

We have on a previous occasion given some particulars of the progress at Barking in the course of last year. In the conclusion of these supplementary notes, Mr. Petre expresses his great regret that the means of rendering many thousand acres (much in need of it) in the highest degree productive, should be still running to waste on the Thames, as if it were something to be got rid of at any sacrifice; whilst its equivalent, or rather an inferior substitute, is being imported from Peru and elsewhere at an enormous annual cost.

Two letters from the *Times*, by Mr. J. Bailey Denton, C.E., on "Sanitary Works and Sewage Utilisation," have been reprinted under this title, and published by Spon, of Charing-cross. In these letters Mr. Denton urges various points of sanitary importance, and especially as regards the risk of sewers soddening the subsoil of towns with sewage, and the necessity for drainage of town subsoils. He also urges the necessity, in sewage irrigation, of taking care that the sewage passes not merely over the surface of the land, but through it, to a sufficient depth to ensure its deodorisation and purification.

As to the subsoil of towns, he maintains that sewers, which allow of the subsoil draining into them, must needs allow the sewage flowing through them to percolate into the subsoil, and so to saturate it with sewage; while, on the other hand, if the sewers be water-tight, and no other drainage applied to the subsoil, of course it cannot be drained. The necessity for a separate drainage of the subsoil, therefore, he considers obvious. The only case, he remarks, where this has been carried out is at Salisbury, and he believes that the improved sanitary state of that town is in some respects attributable to this drainage of the subsoil.

In conclusion Mr. Denton says:—

"Since the lowering of the subsoil water in England has been shown to have such a beneficial influence in a sanitary point of view, and since the existence of stagnant water in the marshes of Italy is known to provoke and maintain malaria, which prevails only by reason of the want of suitable under-drainage, surely it *is a point worth ascertaining, as the ground-work of future legislation*, whether it is not essential to health that all lands irrigated with sewage should be perfectly under-drained. This question, together with those relating to the *separate* drainage and sewerage of towns and the ventilation of sewers, might be determined by a careful inquiry, conducted by practical men; and questions of such vast national importance should at once be placed beyond the position of subjects for mere controversy and the expression of opinion."

A "Report by the Deputation appointed by the Board of Police of Glasgow to visit the City of Bristol and various Towns in England, as to Sanitary Matters," has been printed at Glasgow, by Anderson, of Ann-street. The result of their observations as regards the densely-populated quarters of Glasgow is, that the close staircases and branching lobbies of the tenement "flats" should be better ventilated; that the apartments ought to have the number of occupants diminished; that ash-pits, privies, and water-supply should be increased, deodorising material introduced, and cleansing enforced; that courts and closes should be properly paved; that ventilation and cleanliness should be inculcated by a system of visitation; that in cases of fever strong chemicals, and especially carbolic acid should be used to destroy the fever germs; and lastly, that an improved construction of poorer class dwellings should be commenced:—

"We suggest [they say] that greater pains be taken to keep our streets as clean as possible. We found that even in the most crowded thoroughfares of London boys are employed to gather the horse-droppings, and that in the new viaduct in Holborn recesses are provided for these when gathered, showing the importance attached to their immediate removal, not only to keep the streets clean, but also to prevent their being blown about in dry weather and inhaled by passengers.

With regard to the disposal of our sewage, the subject is one surrounded with difficulties, chiefly owing to its immense quantity and its being so much diluted.

We found most other large towns in earnest in dealing with this great question; and it is most desirable that we also should as soon as possible be prepared to adopt some plan, especially as to water-closet sewage. From all we could learn, we do not think that its being allowed to flow into the river produces disease; but we found a very general opinion to prevail, that its presence in the sewers generated foul and noxious gases, which were apt to find their way into dwelling-houses, and to produce disease there. We would recommend the Police Board to adopt some means, either by the use of chimney-stalks, or otherwise, to draw away these gases from our sewers. We have already indicated our opinion to be in favour of the utilising of our sewage, either by using it in irrigation alone, or by otherwise applying it to the ground for ordinary farming purposes; and we would venture to recall to the recollection of the board a plan suggested by our city architect, Mr. Carrick, some years ago."

The damage and inconvenience which are invariably created in Manchester and Salford by the rapid rising of the River Irwell in times of heavy rain, and the filthy condition of that stream at all times, in consequence of the sewage of the town being thrown into it, have led to frequent and loud complaints. Mr. E. Corbett, sanitary engineer, has propounded a scheme for the prevention of floods and the interception of town sewage in Manchester and Salford. In this scheme the provision for floods, and that for ordinary sewage, are quite separate and distinct. The nature of the scheme may be further seen from the following estimate of the cost by comparison with, and adoption of, the figures used in the several engineers' reports on this subject:—

Flood tunnel, two miles, at 72,000*l.*	£144,000
Inlet works	6,000
Improving two weirs	10,000
Deepening river-bed for three miles (*i. e.* Crescent to Throstle Nest)	6,000
For floods	£166,000
Intercepting sewer, six miles, average 4 ft. diameter, at 2*l.* per yard	21,000
River-wall and towing-path, four miles, at 3*l.* per yard	21,000
Sewer junctions, &c.	2,000
For sewage and navigation	£44,000
Total	£210,000

After some criticisms on the schemes of Mr. Bateman and Mr. Hawksley, the following list of towns with acreage under irrigation is given:—

Name of Place.	Acres under Irrigation.
Aldershott Camp	250
Alwick, Cannongate	350 to 400
Bingley, Yorkshire	30 to 40
Birmingham	130
Braintree	20
Bury St. Edmund's	—
Carlisle	80
Cheltenhem	120
Croydon	360
Edinburgh	—
Hopwood	6
Leek	130
London	—
Mansfield	400
Melton Mowbray	—
Milverton	4
Mold	6
Nottingham	—
Oswestry	300
Rugby	400 to 500
St. Thomas, Exeter	150
Swaffham	5
Tavistock	90
Uckfield	4
Worthing	40

Mr. Duthie, of Preston, suggests to all agricultural societies the great necessity of offering prizes for the first, second, and third best systems of utilising town sewage for agricultural purposes, such plans or systems to be shown by models and drawings at the forthcoming shows. The judges in this department, as he remarks, ought to be gentlemen possessing a practical knowledge of agriculture, as well as of civil engineering.

The report of Mr. John E. Palmer, the Rugby town surveyor, to the local board of health upon the Rugby sewage irrigation farm for the past year has been printed. It is only a little more than twelve months since the Rugby system of sewage irrigation was completed and placed under Mr. Palmer's superintendence, although the sewage had been partially disposed

of by irrigation ever since 1853. The report says:—

"Taking into consideration that this is the first year after the completion of the works, and that the arrangements require a great deal of modification and adjustment (being in fact only in their rough state), the results are on the whole satisfactory, and the prospects encouraging. Still more satisfactory is it to your Board that the primary object for which the works were undertaken has been obtained, namely, the non-pollution of the river and the perfect purification of the sewage. This, I think, has been fully done, without the slightest complaint or nuisance to any one, and there is no reason why it should not be fully maintained."

That the atmosphere of the sewage farm is not injurious to health appears from the fact that the family of one of the men resident on it, who had been brought from a confined part of the town in a state far from healthy, have been restored to good health by the removal to the country air, in spite of the irrigating process applied to the land on which they reside. Rugby has the advantage of being able to dispose of its sewage by gravitation, and the surveyor is very sanguine of highly successful results in a year or two. Meantime the receipts already exceed the expenditure by 58*l.*, although the grass grown has only realised as yet 8s. a ton, while, where its value is better known, 15s. to 21s. a ton are readily obtained. The report is a valuable one.

STAMPS ON LEASES.

THE alarm sounded in our pages at the commencement of the year has awakened the echoes, which are always more numerous than voices. Since then, an action, as desired, has been decided in the Court of Exchequer, and has made the unfortunate position more certain. This was:—

Boulton, Appellant, v. *The Commissioners of Inland Revenue, Respondents.*

The question before the Court was whether a lease made in consideration of a yearly rent and of a covenant with the lessee to complete an unfinished house is chargeable under 17 and 18 Victoria, cap. 83, with any duty besides the *ad valorem* duty on the rent. The 16th section of the Act, relied upon by the Crown, states:—

"And in any case when any deed or instrument which shall be chargeable with any *ad valorem* stamp duty in respect of any sum of money yearly or in gross, or any greatly increased sum therein mentioned, shall be made also from the further *or other valuable consideration*, such deed or instrument shall be chargeable (except where express permission to the contrary is or shall be made in any Act of Parliament) with such further stamp duty as any separate deed or instrument made for such last-mentioned consideration alone would be chargeable with, except progressive duty."

Mr. Manisty, for appellant, said the really simple question was whether land let on lease was chargeable, not merely as a lease, but whether an additional duty is to be imposed if buildings are to be erected on the land.

The Court seemed to think the question too clear for argument, and that the Act expressly met the case before the Court. The words in the section of the statute, "or other valuable consideration," were introduced for the purpose of imposing an additional duty where buildings were being or were to be erected.

Judgment for the Crown.

This affects a large body of persons, and calls for united action to obtain a revision of the Act. Every lease, with scarcely an exception, contains a covenant to repair. Hitherto the extra stamp, now declared indispensable, has never been demanded by the commissioners, far less paid by lessees. The neglect to affix a stamp legally chargeable renders a deed incomplete, or at least useless in a court of law. Except in certain circumstances a delay of two months after the date of the execution of a deed is allowed, within which time the stamp may be affixed without extra charges. After that period 10*l.* must be paid, in addition to the stamp, by way of penalty. Hence it follows that, with the exception of leases executed within the last two months, in which case the omission may still be rectified, every leaseholder is liable to a charge of 11*l.* 15s.—*i.e.*, 1*l.* 15s. for the covenant stamp, and 10*l.* penalty. Such is the effect of the decision arrived at by the Commissioners of Inland Revenue, and sustained by the Court of Exchequer. The unfair working of the section upon which the above decision has been given is clear.

In the first place, according to the strict interpretation of the section, all leases are chargeable with the additional stamp, without regard either to the purchase or rental value of the property, or to the period for which the lease has to run. While the duty on the mere lease is *ad valorem*, the covenant stamp on an 8*l.* rental is the same as that chargeable on a 100*l.* rental, and a lease for seven years is equally chargeable with a lease for 99 years. The charge is besides a constantly recurring one, since every fresh lease containing the usual covenant to repair and uphold, involves the payment of the extra stamp. To put an extreme, but not impossible case—a lease for 99 years, which continues without interruption for 99 years, is liable to a single payment of 35s. But supposing a fresh lease to be entered into every seven years, the whole sum paid to the Board of Inland Revenue would amount to more than 24*l.*

In the second place, since the same covenant stamp is payable on a ground-rent of 8*l.* as on a ground-rent of 100*l.*, it is clear that a burden is imposed upon leases of small value, which will prove a very serious check to the erection of houses of moderate size. The payment of 35s. extra duty may not be seriously felt in the case of a 100*l.* ground-rent; but it will weigh very heavily on ground-rents of as low a value as 3*l.* per plot. It is scarcely to be doubted that Parliament will afford a remedy, if the position be properly pointed out, and steps should be immediately taken to have a Bill brought in with that end in view.

FEVER NESTS IN POPLAR.

AT the Worship-street Police-court, on Saturday, Mr. Charles Young, solicitor, applied to Mr. Paget for ten summonses against James Richards, the owner of as many houses in Commodore-court, High-street, Poplar, for permitting a serious nuisance to exist on his premises, which were unfit for human habitations. The ventilation in each building was defective, the privies were foul and dilapidated, there was no water supply, the houses were in a dirty, ruinous, and unwholesome condition throughout, so as to be a nuisance and injurious to health. The Board of Works wished to shut up these fever dens, and prevent the spread of cholera and other diseases which must extend if they were suffered to exist in their present state. Mr. Shadrake confirmed the statement of the solicitor, and said much alarm prevailed in Poplar relative to the tenements complained of; they were dangerous or falling down, and in other respects ought to be closed. The defendant had no defence to the last two summonses, and could have none to these. Mr. Paget said he had heard enough to justify him in granting the summonses. The houses ought to be closed, lime-washed, and repaired, and the cesspools put in order.

THE NEW MECHANICS' INSTITUTE AT BRADFORD.

LORD HOUGHTON has laid the foundation-stone of the New Mechanics' Institute, to be erected at Bradford. Most of the principal persons in the town took part in the ceremony, and a large crowd witnessed it. After having laid the stone, Lord Houghton delivered an address, in which he enlarged on the importance of such institutions as that thus founded. The Mayor of Bradford, Mr. Miall, M.P., and other gentlemen also delivered addresses. The new building will cover 1,000 square yards, and will have a lecture-hall to seat 1,000 persons. The land on which it will stand has cost 12,000*l.*, and the building will cost about 13,000*l.* The site is in one of the most prominent positions in the centre of the town. The advantages of this building over the old one in Leeds-road are many. The lecture-hall is to be much larger and loftier. On the upper floors suites of class-rooms are provided, and also large well-lighted rooms, suited for the exhibition of drawings, models, casts, and other works of art, and forming at the same time drawing-rooms for the school of art in connexion with the Institute. On the first upper floor, facing the Bowling-green, is arranged the library and reading-room, of lofty and ample dimensions, at the rear of which is the lecture-hall. Two large wide stone staircases, entering from Tyrrell-street and Market-street, are arranged to serve the lecture-hall, and also a large central staircase from the Bowling-green entrance to serve the reading-room and library. In case of panic the whole of the three large staircases can be used for the lecture-hall. The second upper floor is appropriated for class-rooms, and the third upper floor is used for secondary class-rooms and the drawing-rooms: these latter rooms are lighted from the top. Each floor is provided with lavatory and water-closet accommodation, and each room will be efficiently ventilated, and more especially the lecture-hall, which will have special ventilation provided. The ground-floor is principally devoted to shop purposes, each shop being provided with a cellar. The whole of the building is intended to be fireproof. The external appearance of the building is of the Italian style of architecture, and simple in design.

The building was designed and is being carried out under the superintendence of Messrs. Andrews, Son, & Pepper, architects, Bradford. The contractors carrying out the works are for mason's and joiner's work, Mr. Archibald Neill; plumber's, Mr. C. Nelson; plasterer's, Mr. J. Laycock; slater's, Mr. Jos. Hill; painter's, Mr. H. Briggs; fireproofing, Messrs. Phillips & Co.; the whole being under the supervision of Mr. R. Stewart, as clerk of the works.

THE ROYAL EXCHANGE.

WILL nothing ever be done to make the Royal Exchange rather more worthy of the City of London? We should all blush to think what the "intelligent foreigner" must feel when he enters from under the imposing portico, with some sentiment of awe, let us hope, at the world-wide importance of all that takes place in that famous building, to find a sloppy, draughty, empty court-yard, with a soot-begrimed statue of her Majesty in forlorn solitude in the centre, and what there may be of architectural beauty distorted and vulgarised, like the interior of our railway stations, with boards of a thousand coloured advertisements. If any arrangement had been deliberately determined upon to destroy the effect and the utility of a great public building, it could scarcely have been more consistently carried out than in the present sacrifice of the great central court of our Royal Exchange.

As we are never likely to enjoy the climate of Southern Italy, where such open courts are appropriate, and from which the design of this one has been borrowed, the obvious and often-urged remedy is, of course, to protect it by glass from the inclemencies of the climate we have to submit to. The effect of this would be to relieve to a great extent the overcrowded and ill-ventilated rooms upstairs, where the special business which may draw men there would be alone transacted; while a grand central hall would be formed which, with appropriate wall decorations and groups of sculpture (where the Peabody statue and Gibson's beautiful statue of Huskisson might find a place), would be worthy of a building of so much pretension, and of so much importance in the City. Whatever engineering or private difficulties may be raised to this, they should be made to give way to an improvement which would gratify the country as much as it would contribute to the convenience of all who have to enter the building. I hope, sir, you will not let this matter drop.

A. P.

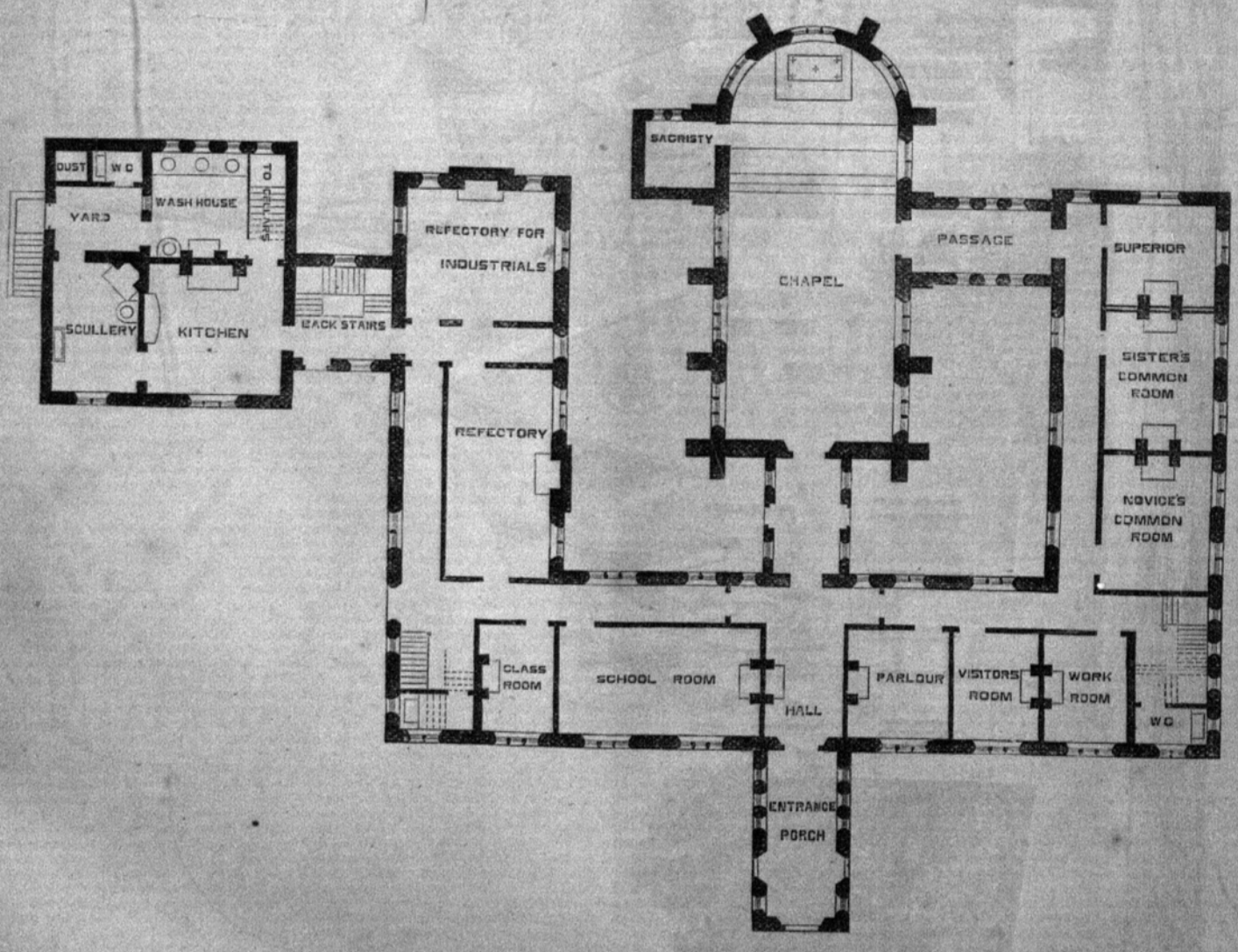
ANGLICAN CONVENT OF THE HOLY TRINITY, OXFORD.

THIS building, with the exception of the chapel and part of the north wing, has been erected for the Society of the Holy Trinity, an Oxford sisterhood which has for its object the education of young girls of different classes, divided into upper, lower, and industrial schools, Earl Beauchamp being the patron. The building occupies an excellent position on the Woodstock-road, at the corner of the Bevington-road, near to the Church of SS. Philip and James, and is built of Kirtlington walling stone, with Box stone dressings, the roofs being covered with Stonesfield slates; internally, the walls are lined with red and white bricks unplastered, and the timbers of the roofs, floor-joists, plates, and such like, are wrought, and exposed to view,—the joists being ceiled and pugged between at about half their depth. The porch and hall floors, and all ground-floor passages, are tiled; the staircases being of stone, with wrought-iron balustrades.

The accommodation consists of school-rooms, refectories, kitchen, and offices, common-rooms for sisters and probationers, dormitories, visitors' rooms, small bedrooms for sisters, bath-rooms and lavatories, well supplied with hot and cold water: a part of the north wing is fitted up as a chapel until the permanent chapel can be built; this is intended to be vaulted throughout, and is designed in the Early English style, of a simple and somewhat severe type.

The works have been carried out by Mr. J. Wyatt, of Oxford, builder, from the designs and under the superintendence of Mr. C. Buckeridge, architect.

MR. CHARLES BARRY, *Architect of Dulwich College.*



ANGLICAN CONVENT OF THE HOLY TRINITY, OXFORD.—Plan.

ANGLICAN CONVENT OF THE HOLY TRINITY, OXFORD.—MR. C. BUCKERIDGE, ARCHITECT.

COMPENSATION CASES IN NOTTINGHAM.

THE Midland Railway Company, in the course of the recent improvement and extension of their station and works at Nottingham, had occasion, under the compulsory powers which they possess, to purchase from the Corporation of Nottingham, in whom the property vested a certain branch canal, called the West Croft Canal, which they filled up and appropriated the site to the uses of the railway. This acquisition of property necessary for the purposes of the railway was happily effected by mutual agreement to the satisfaction of all parties, and the filling up of the branch canal, which was but little used, and had, in fact, become, on sanitary grounds, a crying nuisance to the neighbourhood generally, was admittedly a great public improvement.

There arose, however, the usual cluster of claims for compensation for injuriously affecting, from owners of property on the banks, who had the right of user of the canal, such as it was. The smaller of these claims became settled by agreement; but certain others, of larger amount, have recently been the subject of arbitration under the 68th section of the Lands Clauses Act, with the results which follow.

1st. Mr. Samuel Morley entered a claim for 1,131*l.*, which was heard at the Nottingham Assizes, and was supported by the following professional witnesses:—Messrs. T. C. Hine, R. Evans, F. Jackson, and J. C. Gilbert; while the railway company were represented by Messrs. M. O. Tarbotton, T. Huskinson, J. S. Norris, and F. Bakewell, whose estimates ranged from 75*l.* to 127*l.* The verdict of the special jury was for 300*l.*

2nd. Mr. James E. Hall claimed 2,500*l.*, and was supported by Messrs. F. Jackson, R. Evans, T. C. Hine, and H. Goddard. The railway company's witnesses were Messrs. T. Huskinson, M. O. Tarbotton, J. S. Norris, and F. Bakewell; and, after a consultation at the hearing, it was agreed that the award should be for 1,800*l.*, *plus* a strip of land lying in the rear of the premises, formerly the bed of the canal. The arbitrator for the claimant was Mr. Jeremiah Matthews, and for the company, Mr. C. E. Cawley; the umpire, Mr. Ryde, of Westminster.

3rd. Messrs. Shepperley and Whitehead entered a claim for 4,000*l.*, which Messrs. R. Evans, F. Jackson, and H. Goddard supported, and which was met on the part of the railway company by Messrs. J. S. Norris, F. Bakewell, M. O. Tarbotton, and T. Huskinson, whose estimates varied from 500*l.* to 664*l.*; the umpire, Mr. Hunt, of London, awarding 1,150*l.* Mr. Matthews and Mr. Cawley were again the arbitrators.

4th. Mr. Henry Hind's claim, the last settled, was for 3,000*l.*, and was supported by Messrs. F. Williamson and R. Evans, surveyors, and Mr. R. Hubbart, accountant. The railway company's valuers were Messrs. M. O. Tarbotton, J. S. Norris, T. Huskinson, and F. Bakewell, who gave estimates of the damage sustained, varying from 432*l.* to 520*l.* The arbitrators were, for the claimant and the railway company respectively, Mr. Henry Goddard and Mr. C. E. Cawley; and the umpire, Mr. Pownall. The last-named gentleman has just published his award, which is for 750*l.* in full of all claims.

ARCHITECTURAL TERRA COTTA.

CONSEQUENT on receiving a trade-book of priced designs, manufactured in terra cotta, by Messrs. Doulton & Co. (a book that some of our readers would find useful), we looked at what this firm are now doing, and saw some very good work of its kind. There are several very important points to be considered in the production of terra cotta, a failure in any of which will prove disastrous. Much care is needed in the preparation of the clay, to render it equal throughout in its character; for without this the skrinkage will be irregular. Special care is also needed in the firing, both for colour and hardness, to secure imperishability; for if the firing be insufficient and unequal, it will turn out soft, and subject to decay.

The selection of clays is another important matter. The clays in use in Lambeth are those of Devon and Dorset, from which articles can be produced of close texture, fitted to resist thoroughly the action of the atmosphere, and in large cities and manufacturing districts that of smoke and acid vapours, which fire-clay goods, unless in special cases, often fail to do, on account of their openness, and consequently the absorbent nature of the material. The goodness or badness of the decorative forms taken by terra cotta of course depends on the artist employed. Messrs. Doulton have resorted to the Lambeth School of Art for assistance in this direction, and some of their modellers have secured honours both at South Kensington and the Royal Academy: to one of them the gold medal of the Academy was recently awarded. It may be expected, therefore, that they will be able to carry out the designs of architects in a satisfactory manner.

The character of the art applied to terra cotta is of course of the utmost consequence; it is capable of receiving the most delicate as well as the boldest touches of the artist, and while in its plastic state can be undercut, so as to produce the deepest shadows it is possible to obtain in the most elaborate carving. The cost, in comparison with hard stone, is moderate; where repetition and high decoration are wanted, it can be produced at about one-half the price of work in good Portland stone.

As long as thirty-five years ago, the firm executed the statue and coat of arms of Sir John Crosby, which are attached to the exterior of Crosby Hall, Bishopsgate-street, and endure well. The material they are now making is of a more homogeneous body, and has more uniformity of colour; it rings clearly when struck, and resists a sharp-pointed instrument,—both important tests in determining the probable value of terra cotta.

DANGEROUS STRUCTURES UNDER THE BUILDING ACT.

OUR readers know that previously to the commencement of the present year all cases of dangerous structures were brought before the magistrates by the police, acting under the directions of "The Dangerous Structures and Lodging-house Department" of the police of Scotland-yard. By the passing of the 32nd & 33rd Vict., c. 82, 1869, the work of the police relating to "dangerous structures" has passed into the hands of the Metropolitan Board of Works, and on the 27th ult. the owners of 21, Bell-alley, St. Luke's; 7, Little Saffron-hill; 17, Union-court, Holborn; and 10, Seabrook-place, White Lion-street, Clerkenwell, were summoned by Mr. Fry, on behalf of Sir John Thwaites, under the provisions of the Metropolitan Building Act, 1869, to show cause why, there having been a survey made of the structures by a competent surveyor, and the structures having been duly certified as having been in a dangerous state, they the owners had not done the work which was called for by the Board.

In all cases orders were made for the work required to be done.

THE NATIONAL EDUCATION QUESTION.

THE great question now is whether thousands and hundreds of thousands shall be allowed to grow up in the densest and deadliest ignorance, because their friends and well-wishers cannot agree as to the course that should be pursued. The denominational system, as it is called, *has* failed to do all that was required, and *will* fail to do all that is required. No sooner is the "National Education League," established with a view to effect what has been left undone, than the "National Education Union" starts into life, less to bring about what is absolutely needed, than to oppose, tooth and nail, the doings of the League. A large proportion of the population cry distinctly,—This shall not go on: something *shall* be done. The Council of the Society of Arts, with a view to bring parties together, if possible, have invited a conference for Monday next (7th), "to discuss the best means of providing throughout the country a national system of education, whereby every child in the kingdom may have opportunities of obtaining elementary instruction, of a character at least equal to that which is within the reach of all in Prussia, Saxony, Switzerland, and other Continental countries." Two years ago the Society of Arts held a conference on "Technical Education." The conference was well attended by leading manufacturers, members of Parliament, and others interested in education, and much valuable information was elicited. A committee appointed at that conference drew up a report, in which the absolute necessity of an improved and extended system of scientific instruction was pointed out. At the same time, it was felt by the committee, and the council are strongly of opinion, that it is of comparatively small value to provide means for the teaching of science and art, unless, in the first instance, the people are prepared to take advantage of it by an extended and improved system of elementary or primary instruction. The council are desirous of discussing how far the various schemes may be harmonised, and whether the common object, the education of the people, may not thus be attained; and they have framed a programme for discussion, in which it is attempted to combine and supplement, in a scheme practicable at the present time, the best features of the National Education Union, the Manchester Education Bill, and the National Education League proposals.

The conference will commence at eleven o'clock, adjourning at half-past one for half an hour. The discussion will be resumed at two o'clock, continuing till five, when it will be adjourned till seven o'clock in the evening.

We would mention that a full report of the proceedings of the first general meeting of the National Education League, held at Birmingham, has been published by Simpkin & Marshall.

THE WORD "THOUSAND."

I WAS sitting this morning in one of our public libraries, discussing Professor Huxley's "Celts and Saxons," when my neighbour told me that those incompetent people, the Saxons of old, could not count beyond one thousand. "Why," said he, "the word itself proves it: it is 'thus-end'—*finis*."

When at leisure, I took up the Mæso-Gothic Gospels, and made the following extracts:—

I.

Mark viii. 9.	Mark viii. 20.
Thusundyos, Mæso-Gothic	Thusundyom, M.-G. = 1,000
Thusend, Anglo-Saxon	Thusendum, A.-S. = 1,000

N.B.—The Anglo-Saxons took the liberty of changing the second *u* into *e*, thus making "end" = finis.

II. Luke xiv. 31.

Taihun thusundyom, Mæso-Gothic	= 10,000
Twaim tigum thysundyo, ditto	= 2?,000
Tyn thusendum, Anglo-Saxon	= 10,000
Twentigum thusendum, ditto	= 20,000

III. Luke xv. 4.

Taihuntehund, Mæso-Gothic	= 100
Hund, Anglo-Saxon	= 100

The word "hund" is formed from tai-*hun*, by the addition of a final *d*; and originally stood for *ten*.

Hundred is an abbreviation of *taihunte-hund*, and stands for *ten-tens*.

The word "thousand" is formed by an extension of the same system, thus: we should have, I suppose, *taihuns taihunte-hund*, *i.e.*, ten times ten-tens, which is abbreviated to *t ai hu n s-h und* = "t-hu-s-und (yos-o-um)," and finally *thousand*; the chief anomaly being, that "n" in *taihun* and "h" in *hund* are omitted. Thanks to good Bishop Ulphilas, who is said to have done all this for the Pagan Goths more than *twalif-taihunte-hund* years ago.

Few etymologies could be more clear; and it follows that the fanciful "thus-end" is a corruption of the common-sense *ten-hund*.

A. H.

DEATH OF AN AMERICAN MUSICIAN.

THE obituary of the *Times* announces the death of L. M. Gottschalk, the celebrated pianist and composer, aged 40. The accompanying extract concerning him, from a letter just received from Rio, may prove of sufficient general interest for your journal. F. S.

"During the past six months we have had a good deal of musical excitement here, which, I regret to say, has just ended with the death of its originator, the famous American pianist, Gottschalk. G. arrived here about May or June last, and took the world here by storm as soon as he appeared in public; his extraordinary skill and extreme refinement in playing being something never yet heard in Rio, whilst the originality of his compositions was also much admired. I never heard anybody in Europe to equal him in refinement and exquisite delicacy of execution, though I have heard pianists that played with more expression. In addition to his musical genius, Gottschalk possessed all the polish of a gentleman and man of the world to a degree seldom met with in Americans; his talents as a linguist were very great, as in addition to English, he spoke French, Spanish, and Italian remarkably well, and during the short period of his stay here he had already learnt to speak

Portuguese very fairly. His amiability of character made him many friends among the Brazilians and strangers here, and his loss is universally felt. I became acquainted with him soon after his arrival, and saw a good deal of him. One of the great novelties which he brought before the public was a concert in which sixteen pianos were played together by thirty-one pianists (amateurs and professionals, myself among the former), accompanied by a grand orchestra, and the effect produced was very fine. It took immensely, and would, I think, have made a sensation in England too. There were several repetitions of the performance subsequently, so we had to appear before the public pretty often. We played in the opera-house, which is about the size of Covent Garden, or little short of it. A month ago, G. gave a monster concert of 650 performers, which he managed to get together by the most indefatigable exertions; the concert proved a great success, but the incessant trouble and fatigue he had in copying out the different parts and drilling the musicians proved too much for him, the more so as his health was already undermined by the continual excitement inseparable from a life like his. His funeral was attended by an immense number of people, the body having previously been embalmed and laid out in state."

THE ROADS IN HYDE PARK.

HAVE you ever picked your way over the *Rotten Road* of Hyde Park, after a little rain? If not, do so, as one of the curiosities of famed London. But pray take a pair of stilts with you. It is really a disgrace to the park management. Poor pedestrians who have to cross have the satisfaction of wading through a disreputable mass of slop, which can only be compared to the sweepings of a bad road against the curb, waiting to be carted away, with this difference, that the late supposed mending of the road with brick-rubbish containing an amount of lime, causes the delicious hodge-podge (a kind of thin mortar), when dry, to stick tightly to the boots of the unlucky wearer. If one penny out of each hundred pounds spent in ornamentation were appropriated to make a useful and decent crossing or two, many of both sexes would be thankful; and I feel sure that none of the riders would complain of their horses having to pass over a few feet of a paved way. S.

DEPRESSED STATE OF THE BUILDING TRADES.

SIR,—It is a sad and lamentable fact that there are thousands of families in this metropolis who are literally starving; tradesmen who are well able and willing to do a day's work cannot obtain it; and what makes it more distressing is, that we cannot see when this state of things will end. The future prospect is no brighter than the past. Industrious, respectable, and persevering men find themselves in a dilemma from which they know not how to extricate themselves. The savings of bygone years have been spent; every available article of furniture has been parted with; credit has been obtained to its farthest limit. All this has been endured with the hope that something would turn up; but there seems no more chance of its realization than there was three months ago, and the workman is put to his wits' end, not knowing what to do. With such a state of things as this, we need not wonder that the police and magistrates are kept busily engaged, or that many choose to end their troubles by putting an end to their own existence. I take my own case as an illustration, having completed a large and important building some six months back. I have since tried every means to obtain another situation, but in vain, although possessing very highly satisfactory references as to character, ability, &c.,—a plain proof that no matter whatever capabilities a man may possess, or however desirous he may be to obtain work, in this present depressed state of trade he will have great difficulty. It would be well if mine were an isolated case, but I know there are vast numbers in the same position.

Surely this is not as it should be. Cannot something be done to give employment to those who are both able and willing to work? A heavy responsibility rests somewhere, for it cannot be expected that a continuance of such deep affliction will be always patiently endured.

BUILDER'S FOREMAN: A MASON.

EASTER ISLAND, OR RAPA-NUI (GREAT RAPA).

I HAVE read with great interest the articles which have lately appeared in the *Builder* upon the subject of the Easter Island statues; and having myself visited that island in the *Topaze*, and explored it as thoroughly as the time permitted, it may interest your readers to hear the reasons which have induced me to form a different opinion from your correspondent's, and to conclude that the monuments were the work of the ancestors of the present Polynesian inhabitants.

Your correspondent considers his views as to a pre-historic race confirmed by Professor Sedgwick's "suspicion that Polynesia was once a continent;" and he assumes that Easter Island has "an identical flora and fauna" with the other islands, and that it is "crawled over by the same families of flies and beetles;" but had he visited it, he would have found only one wild animal, the rat (kiöe), and one land-bird, namely, the domestic fowl: these, as well as the sweet potato, are known to have been carried by the Polynesians in their migrations; and the scanty flora is, at least, as much New Zealand as Polynesian. To the latter I attribute the sugar-cane, paper-mulberry, and banana; to the former the ferns,* the toro-miro (an acacia-like shrub), and the tufted grass. The only other plant which was seen in any quantity was the vervain, said by the natives to be also an importation. I saw but one insect, a yellow butterfly, and no reptiles.

I believe that your correspondent is misinformed as to there being a cave in which "are two large images, below the sea-mark;" but should it be a fact, it must be considered with reference to the volcanic formation of the island, every hill upon it being a crater; and the subsidence of the side of one of these volcanoes is surely slight evidence upon which to decide that an entire continent had also sunk beneath the waves; how deep, we can only infer from the clear dark blue of the surrounding ocean; which, even your correspondent thinks, must be as deep as Cotopaxi is lofty; and surely an idea so extraordinary as this subsidence of a continent has seldom occurred to any one's mind, for the statues (which are generally placed round the coast, and not inside the craters) must then have stood breast deep, at least, in the perpetual snow.

We have, however, sure records, that the Polynesians in the Sandwich and Marquesas Islands actually built stone platforms, just such as we found at Easter Island; and that on those platforms were mounted large wooden images. Now, what would such a race do on their arrival at Easter Island? First, no doubt, they would plant sweet potatoes, which would give an abundant increase; then, with leisure, their propensity for carving would return; and having built their platforms, how could they get images to set thereon? Wood could not be got, for the island was treeless; but the stone was easily worked, and would naturally be made a substitute. As they cut more deeply in the stratum of rock, they would cut larger blocks; and their greater experience would enable them to place them in position.

It is true they had "no metal, nor even flint," from which to make their tools; but they had a harder volcanic rock, and abundance of obsidian, with the powder of which it could be ground into shape. The implement used for carving, when finished, was called a "tingi-tingi,"—a name which bears proof, as we pronounce it, of having been given by the race who had heard the sound of its sharp blows, followed closely by the echo from the sides of the crater around it.

That the present race were stone-workers is certain, for all over the island we found stone foundations neatly squared and let into the ground, ready again to receive into the holes, which were at regular distances, the ends of the branches which formed the framework of the huts, as Captain Cook describes; and under three statues which had fallen from a platform was a vault, the entrance of which was formed of hewn stone, proving that they continued to work in stone after the statues had fallen, possibly within the last hundred years.

Your correspondent doubts if the carving on the sides of the heads of the statues represent ears. To convince himself of this he must look first at the likeness of the Easter Islanders in Captain Cook's voyages, and imagine the long, loose flaps of these ears filled with the ornaments which they used: then let him compare an ear so ornamented with the ears of the wooden domestic images; these again with those of the statues, and he will have traced a distinct connexion between the ears of the present race and of the statues. Is it credible that two races inhabiting the island at such distant periods, would each have invented so peculiar and uncomfortable a custom?

Every statue on the island has a separate name or title.* Would an alien race have cared thus to rename them? or is it likely the pre-historic race would have crowned them with head-dresses of rock of the red colour which the Polynesian chieftains so highly prized?

I do not understand what your correspondent means by "carved emblems of nature worship, and of ibis-headed figures." The rocks, it is true, were scored with rude figures of birds, ships, &c., but the birds resembled gulls, or domestic fowls, quite as nearly as they did the Egyptian ibis.

When Captain Cook visited the island, perhaps two-thirds of the statues which he saw were fallen, and none of those then seen are now remaining erect; one third have, therefore, fallen within one hundred years. How long is it probable that the two-thirds fallen before his time remained standing? Those which are standing at the present day are planted in the earth, having been too narrow from back to front either to stand alone or to support the circular stone head-dress, which may have helped to topple over the rest.

As to the number of people necessary to transport the statues, we know that the Peruvians kidnapped 1,500 from this island some seven or eight years ago, that several hundreds more died of small-pox, and that 800 or 900 still remain. As none of the statues which were taken to a distance weighed so much as 20 tons, they had ample numbers; and the grass of the island made excellent rope.

I once took an intelligent boy, a native of Tahiti, into St. Paul's Cathedral in London, and felt much mortified when he asked me if the statues there were the images which our ancestors used to worship. I think your correspondent has retaliated upon the South Sea Islanders, and if the mistake of the young Tahitian caused me such mortification, what would be the feelings of the Easter Islanders, after hearing of the sins which are imputed by your correspondent to their predecessors, and his vivid and terrible (though, I hope, imaginary) description of the punishment which overwhelmed them? We found them most friendly, honest, and amiable; but if he were to venture among them, after such provocation, it would not be surprising if their old cannibal propensities were to revive, and they were to gratify them at his expense. R. S.

* I have ascertained this fact from the authorities at Kew.

* The larger of the two brought home in the *Topaze* was called Hoa-haka-nana-ia; the smaller one, Hava.

THE LONDON WATER SUPPLY.

AT last week's meeting of the Metropolitan Board of Works the adjourned debate on the report of the Works and General Purposes Committee, on the subject of the water supply of the metropolis, was resumed by

Mr. Roche, who said he had placed an amendment on the paper; and his object in doing so was to affirm the necessity of a constant supply. He denied that it was expedient that the supply should be in the hands of a municipality, which in this case meant this Board. So far from this Board being enabled to supply water at a less cost than the consumer had to pay now, he maintained that the cost would be larger. He had calculated that the cost of the supply by the Board, after purchasing up the companies, would be 954,000*l.* a year; and after deducting 175,000*l.* a year for water supplied for trade purposes, 779,000*l.* would have to be raised from private consumers, which would require a three-penny general rate, and a domestic rate of one shilling. He thought that 5,000*l.* or 10,000*l.* a year expended by this Board in controlling the companies would be much more effective in the way of obtaining a constant supply than their taking the supply into their own hands. He moved as an amendment:—

"That this Board does not concur in the conclusion arrived at by the Royal Commission on Water Supply, viz., 'That the constant-service system cannot be effectually carried out in London, so long as the supply remains in the hands of private companies.' That this Board concurs in the general policy enunciated in the report of the Select Committee on East London Water Bills (1867), viz., 'That every metropolitan water company should be compelled to afford a constant supply of water within the

metropolitan area, so that it may be drawn direct from the pipes at all times during the twenty-four hours; and that this Board should be entrusted with adequate powers of compelling the companies to fulfil their obligations.'"

After the amendment was seconded, and some discussion had taken place, the Chairman put Mr. Roche's amendment, and declared the numbers to be for it, 10; against it, 18.

The debate was again adjourned.

CASES UNDER METROPOLITAN BUILDING ACT.

LIABILITY FOR FEES OF DISTRICT SURVEYOR.

THE case "District Surveyor of Stratford-le-Bow and Poplar *v.* The West London and General Permanent Building Society," which was heard at Worship-street Police Court, before Mr. Ellison, last month, will answer some inquiries on the subject of fees that have been addressed to us:—

In May, 1866, notice was given by a builder named Harris, of North Bow, for the erection of five houses in Lefevre-road, North Bow. The works having afterwards been suspended, a fresh notice was given in October following, by Willsmer, of Old Ford-road, for proceeding with the works, and the houses were covered in the same month. The houses remained unfinished for some time, and the builder, Willsmer, could not be found. Subsequently the houses were completed, and some of them occupied by weekly tenants, but the district surveyor could not discover the owners.

In September, 1869, the district surveyor ascertained that defendants were the owners, and made his claim for fees, and on payment being refused took these proceedings.

For defendants it was contended that they were only mortgagees, and not owners within the meaning of the Act, at the time the fees became due.

The magistrate said the fees were to be paid by the builder, owner, or occupier; that one month after the buildings were covered in the fees became due, and that there was no limit for the time of payment; that the owner was liable for the fees if he were owner at the time the claim for the fees was made, and he was clearly of opinion that the defendants in this case were so liable.

Order made for payment of amount claimed, with costs.*

THE ST. LOUIS INSTITUTE OF ARCHITECTS, MISSOURI, U.S.A.

THE secretary of this new society, Mr. George D. Rand, writes,—

I take the liberty of enclosing to you a copy of the proceedings in organising the above society, which is founded on the same principles as all the Architectural Societies of this country and of England, for mutual benefit and pleasure, as well as to endeavour to raise the public taste in matters of architecture and art.

"THE ST. LOUIS INSTITUTE OF ARCHITECTS.

The organisation of this society was completed on Tuesday evening January 11th, at a meeting held at the office of Randolph, Bros., by the election of officers for 1870. The following were elected:—President, Thomas Walsh. Trustees, M. Randolph, John F. Mitchell, George I. Barnett. Secretary and Librarian, George D. Rand. Treasurer, R. Desbonne.

A vote of thanks was then passed to the chairman, Mr. Mitchell, and to the secretary *pro tem.*, Mr. Randolph; and also a vote of thanks to the Messrs. Randolph for the use of their offices; and the meeting adjourned.

The next regular meeting of the society was held at the office of Randolph, Bros., on Tuesday, January 18th, at eight o'clock p.m. The office of the secretary, Mr. G. Rand, is at 305½, Olive-street.

The society will at once secure rooms for its accommodation, and commence the formation of a library, contributions to which are invited."

We cordially wish the new society success and hope to hear of its proceedings.

MADDENING BEER.

SIR,—In reference to a paragraph which appeared lately in the *Builder*, in which insanity is said to be attributable in many cases to the use of adulterated malt liquors, I am desirous of pointing out that the officers of the Excise have the remedy, or rather punishment, for adulterating malt liquors, entirely in their own hands. The beer licence expressly states that the licence is granted upon the condition "that the licensee do not sell any beer, ale, or porter made otherwise than from malt and hops;" or mix any drugs or other pernicious ingredients, or fraudulently dilute, deteriorate, or adulterate any beer, ale, or porter he may have for sale. The licence furthermore states that it (the licence) "shall cease, determine, and become void" in case any of the conditions contained therein are transgressed.

Why cannot samples of the different malt liquors sold in London and elsewhere be purchased by the Excise officers, and submitted to the chemists of the laboratory of Somerset House to be analysed? If found to be adulterated, first warn the sellers; if other samples are also adulterated, *withdraw the licence*. If this were done, I feel convinced that we should have an effectual check put upon the rogues who poison us now with impunity. W. T. S.

* This is entirely in accordance with another decision.

"BELLS."

A RAMBLING article on "Bells," containing several blunders, appears in the *Contemporary Review* of this month.

Among other trite matters the author mentions the great bell of St. Paul's Cathedral, and, going out of his way expressly for the purpose, tells his readers that the writer of these lines confidently stated in the *Builder* that the bell was made in 1709.

Now, the author well knows that I made such a statement on the authority of Messrs. Mears, bell-founders, and that having subsequently examined the present bell myself, I stated in the *Builder* that it was made in 1716. He also knows that my articles printed in the *Builder* of December 14, 1867, and of April 4, 1868, contain the most accurate and complete account of the bell that has ever yet been published. THOMAS WALESBY.

EDUCATION AND THE WORKING CLASSES.

SIR,—In venturing to remark on "Jack Plane's" letter in your valuable pages, I have no intention of going into the merits or demerits of the schemes advocated, but the subject is of the greatest importance, and I would beg him and parties whose sentiments he represents, to avoid hard names and ugly words, and thus to gain attention and sympathy. He says, "I believe the working men who know the issues at stake look with dismay on the revival of the *Sectaries*." Whom does he mean by *Sectaries?* If he means people whose religious conviction impels them to assist their ignorant fellow citizens, by providing means of education for their children, why is he dismayed? For to whom have this country, and its working classes been indebted for the spread of education but to those of the public, who usually act on the dictates of conscience? He refers reproachfully to "catechisms and dogmas;" but he ought to be aware that a very large portion of those persons most earnestly attached to Christian principles are scrupulous to avoid imposing them. It really appears ungrateful to sneer at the good already effected by the liberal expenditure and active exertion of Christians, or to blame them as "Sectaries," for the narrowness of a few. Why is he "forced to continue, if he does not like the school?" I suppose he concedes the right of subscribers to manage their own institution, and when the working men subscribe generally, their votes will control the education given in the way they desire. But have they yet shown any real determination to deal with the matter as an affair demanding their highest consideration? Surely a very small part of their money wasted in strikes would suffice for all that is required, without agitating the country, worrying the generous, or troubling Government. His representation of working men is discouraging and contradictory. He says, "I believe success largely depends on the enlistment of working men, who are aware of the deficient state of education, and who are in earnest to provide a remedy;" but he further states, "the best of the working classes are only half in earnest about their children's education." Again, "Only think of a drunken, ignorant parent caring anything for intellectual food, &c." "Jack Plane" may do much good by discussing the subject consistently, and with a charitable regard to others who have the same grand object to promote. H. C.

MASTERS AND MEN.

THE HOUR SYSTEM.

IN the Bloomsbury County Court last week, before Mr. G. L. Russell, judge, a case of some importance to masters and workmen was heard and decided, in which William Pierman, a journeyman painter, brought an action against Mr. Bradwell, house decorator, &c., No. 11, Great Portland-street, Portland-place, to recover the sum of 7½d., for one hour's loss of time, under the following circumstances.

Plaintiff stated that in December last the defendant, who had for some time previously been employed in ornamenting and decorating the Globe Theatre, Strand, pursuant to its opening on Boxing night, engaged him and other men on a "job" to get it finished in time, to work on Christmas Day, Sunday, and the Monday up to five o'clock in the evening, when they left off. About half an hour after, they in a body waited upon the defendant in the green-room for payment, when, without any angry words taking place between them, he said he shouldn't then pay them, and if they didn't go away he would call in the police and have them turned out; ultimately, however, telling them to be at his house the following morning at ten o'clock. Witness accordingly went at that hour, and, after waiting some time, received what was due for his work by time; but, defendant refusing to pay him 7½d., one hour, which was what he charged for the time in going to be paid, although he lost half a day in so doing, and defendant still persisting, on subsequent application, in his refusal to arrange the matter, he, for the benefit of himself and fellow workmen, who wished to know the law on such a point, took these proceedings.

In answer to the Judge, plaintiff said it was a rule in the trade that jobs, which were invariably by the hour, should be paid for when finished; and, if not, the men claimed for loss of time in afterwards going for their money.

Thomas Smith, Henry Godfrey, Thomas West, and Henry Lloyd, painters, who worked with plaintiff on the "job," all corroborated his statement as to what took place at the Theatre after finishing it, and expecting to be paid; the former adding that it was a rule in the trade, as far as he knew, for men to be paid extra when having to go purposely for their money, mentioning the names of Messrs. Moxon, Earle, Collman, and others, who acted on that principle.

Defendant, in reply, said he never heard of such a system; and, as for threatening to send for the police when asked for payment at the Theatre, he might have done so, being much excited and busy at the time, which was fast approaching the hour for the doors to be opened.

His Honour observed, that by the evidence of plaintiff and his witnesses, and the names of the respectable firms mentioned, his decision would be guided, which was that the claim was a just one.

Judgment for plaintiff, and all costs.

DURABILITY OF TASMANIAN TIMBER.

THE inclosed item of information, cut from the *Launceston Examiner* of 4th of December last, which I have just received by the Australian mail from Tasmania, may possibly be of use to some of your readers:—

"The durability of Tasmanian woods has often been spoken of, and another very satisfactory proof of their excellent qualities in this respect has lately been afforded. A post of peppermint wood, which was used fifty-five years ago in constructing a fence on the farm of Mr. Stanfield, Clarence Plains, was lately taken up, and found to be in excellent preservation. The portion above ground has been but little affected, even the splinters on the surface being sound; the end that had been imbedded to a depth of about 2 ft. in the earth was also sound, and but very little eaten away, so little indeed that were it not well known that the fence was made some fifty-five years ago, one would be disposed to say that the post had not been used more than eight or ten years. This fact, taken in conjunction with the statement that the other remaining posts appear equally sound, proves incontrovertibly that this kind of wood is admirably adapted for making railway sleepers, or for any other purpose in which durability is a primary requirement."

The new route, *viâ* the Suez Canal, may so shorten the distances that a trade in timber from our remote colonies may ere long spring up and continue. All will, I suppose, remember the fine timber trophy from Tasmania exhibited in our 1851 collection of products from the colonies. W. H. E.

ROADS IN THE PARISH OF ST. PANCRAS.

SIR,—Seeing recently a letter in your journal, complaining of the roads in the vicinity of Norwood, I am induced to ask your insertion of a few lines about the roads and footways in our neighbourhood, known as the "Mud Island" district in St. Pancras.

Several of the authorities in the vestry take credit to themselves for our parish having the best roadways in the metropolis, and I believe the leading thoroughfares are not to be surpassed by those in neighbouring parishes. I also admit that many of the private streets are well paved and lighted. But I am sure the neglected and unfinished condition of Lismore-circus, Weedington-road, Langford-road, Allcroft-road, and streets adjoining in that part of Kentish Town, is a disgrace to our Paving Board, and such as makes the unfortunate residents frequently exclaim,—"What are the authorities about in allowing such a state of things to continue year after year?"

If you visit our neighbourhood do not come in wet weather. A RATEPAYER.

TREATMENT OF SEWAGE WITH CARBON.

SIR,—For the information of your correspondent, Mr. Hinde, I beg to state that the patent system of sewage treatment referred to in my letter to the *Builder* has been in operation nearly two years, and that the patent has never been disputed. Moreover, it has lately been subjected to the scrutiny of Counsel, and pronounced perfectly valid.

Your correspondent errs in supposing that the use of carbon is at all claimed as part of the patent. No sane man would ever dream of making such a claim, the use of carbon for disinfecting purposes being as old as the Levitical Law—at least. What the patentee claims is the *peculiar mechanical arrangement*, which is equally applicable to closets as to sewers.*

The system is a complete success here (Newcastle-under-Lyne), as the enclosed certificate from the Stoke guardians shows. E. JOHNSON.

LAMBETH WORKHOUSE COMPETITION.

SOME time since premiums were awarded for complete designs for an infirmary and ground plan only of workhouse, particulars of which we gave at the time.

The guardians have since decided not to erect the infirmary, but to build a new workhouse, and to convert the present workhouse buildings for infirmary uses. They therefore instituted another competition for complete designs for a new workhouse.

The following architects were invited to compete:—Messrs. Arthur & C. Harston, H. Jarvis, T. E. Knightley, W. Lee, Beeston & Son, F. Marrable, F. H. Fowler, C. Foulsham, Stenning & Lepard, J. Crawley, R. E. Tyler, Searle & Son, Luck & Rushforth, McMurdie, Newman & Hewitt, and R. Parris.

The designs of those who responded have been hung at the old workhouse in Lambeth.

* Patent dates A.D. 1867, Oct. 24th. No. 2998.

ZINC FOR ROOFING.

A TRADE-BOOK, just now issued by Messrs. F. Braby & Co., contains a considerable amount of information on zinc as applied to roofing purposes, with working drawings. One of the diagrams shows iron rafters covered with zinc, and we know this union is now not uncommon. The impression used to be that under such circumstances an action might be set up that would injure the metal. Is this disproved? Or what precautions are adopted to obviate it? We have the remembrance of finding on one occasion a hole in a zinc flat produced by an iron nail which had rested on it for some time.

MONUMENTAL.

A MONUMENT has lately been erected in the Shenchan Free Church, Stranraer, Scotland, to the memory of Major-General McDowall, C.B., and Miss McDowall, who, during their lifetime, were the generous benefactors of the congregation. The monument, which is of white Sicilian marble, has three pointed crocketed pediments, with bosses set at the angles and floriated finials at the apices. In the middle of the centre pediment there is a cusped panel, with the monogram "I.H.S." The monument stands on a corbel table of flowered marble, projecting boldly from the face of the wall. The design was supplied, and the execution of the work superintended, by Mr. John M'Lachlan, architect: the sculptor was Mr. John Rhind, both of Edinburgh.

KENSINGTON WORKHOUSE INFIRMARY COMPETITION.

THE Kensington Board of Guardians having determined to enlarge their workhouse by the addition of a new infirmary and wards for aged and able-bodied women, invited three architects to send in designs for these works, to each of whom the sum of 30*l.* was paid "as compensation towards the expense of preparing their designs." These designs are now before the Board. The competing architects are Mr. Stanham, Mr. Williams, and Mr. H. S. Snell.

A PAVEMENT BRIGADE.

SIR,—Our roads get swept and scraped, but the pavement in many places never; accumulations remain all the year round—slippery mud, drifting dust, or cakes, may be enjoyed in all directions.

It is asserted that cleanliness is next to godliness, but Bumble thinks otherwise; for the pavements in front of our churches are sadly neglected. Once a week he ought to prove himself useful as well as ornamental. Why not promote some of the veteran scavengers as sidesmen, with long india-rubber scrapers, to perform this cleanly and expeditiously? Men would not then forsake the right paths of life, with a hurrah for the road!

R. T.

NEW CHURCH, BEXLEY HEATH, KENT.

WE understand that the committee have decided to adopt Mr. Burges's selection. The design by Mr. Knight, of Nottingham, who was placed first by the referee, is to be carried out; Mr. T. E. Knightley and Mr. Blackburne, of London, being second and third respectively.

CHURCH-BUILDING NEWS.

Fundenhall.—The old church of this parish, which has been closed during the last nine months for the purpose of undergoing restoration, has been re-opened for divine service. The restoration of the nave and tower was undertaken by the parishioners; Mr. R. M. Phipson, of Norwich and Ipswich, being the architect, and Mr. G. Grimwood, of Weybread, near Harleston, the builder. The seats in the chancel are of oak, the floor being in Portland cement. A piscina which was formerly in the south-end corner is now built up. The nave is fitted with oak benches, and is paved with Minton tiles. The whole of the windows in this portion of the church are new, the early character of the building being represented in their design. The porch is new. In clearing away the mortar on the west side of the north door an ancient stoup was found, which has been preserved. On the south side of the church is a Norman doorway, which is left in its original form; as also are the tower arches, which show signs of the same early character. An old rood-screen formerly spanned the western arch of the tower, and is now (for the sake of preserving it) placed under the west window. The whole outlay on the restoration of the church amounts to 1,400*l.*

Taunton.—The opening of the chancel and unveiling of the new reredos in St. Mary Magdalene's Church have taken place. The plan of raising the floor 2 ft., and placing a new reredos and sculptured entablature behind and about the altar, was acquiesced in by the parishioners. The offer of Mr. John Marshall, of Belmont, to raise the chancel floor and supply the reredos, was scarcely accepted before it became evident that the four arches in the chancel required to be raised correspondingly. The funds for this undertaking were readily supplied by Dr. Edward Liddon, and the work has been accomplished by Mr. H. Davis, builder. Encaustic tiles have been laid on the chancel floor, and brass standards light the sanctuary with gas. The roof of the chancel has been re-decorated from the designs and under the superintendence of Mr. A. Stansell, of Taunton. A large vestry for the choir has also been constructed through the joint liberality of Miss Bampton and Dr. Kelly. The canopied reredos, with its niches and crockets of yellow Mansfield stone, the altar-piece of pure white Caen, representing our Saviour's agony in the garden, sculptured in alto relievo, from the designs of Mr. G. E. Street, R.A., by Mr. T. Earp, Lambeth, together with the standing figure of the Virgin Mary, Mary Magdalene, and the four Evangelists, are said to be well executed.

Market Harborough.—Fleckney Church, Leicestershire, has been re-opened by the Bishop of Peterborough, after a restoration. Until the recent restoration, the church consisted simply of one large open space, unbroken even by a chancel arch. There were no windows in the north wall, that part of the church being entirely dark. The south wall has been taken down, and an aisle and porch built. A chancel arch has been put in, and windows inserted in the north wall; a vestry has also been added. The church has been re-roofed, and paved with Whetstone's tiles, both in the chancel and in the body. Deal stained open seats have been substituted for the old pews, and a chancel screen has been put up. A new heating apparatus has been laid down. This work has been done by Mr. Conquest, of Fleckney; Mr. Kellett, of Leicester; and Mr. Wilson, of Kibworth, from the plans and under the direction of Mr. C. Kirk, of Sleaford, architect.

Oundle.—The work of restoring the church of St. Matthias, at Great Gidding, bordering on Northants, Oundle, has been completed, and the church re-opened. The edifice consists of tower and spire in the Early English style of architecture, with nave, north and south aisles, and chancel. The fabric, from want of means, was in a very unsatisfactory state. A new east window of painted glass has been inserted in the chancel window by Dr. Hatfield, of London and Sawtry, in memory of the Hatfield family. The subjects are "St. Paul," "Our Saviour," and "St. Peter," life-size, forming a three-light window of the Mediæval period. Mr. Webb was the artist. The original contract for restoration was 1,330*l.*, by Mr. C. Bennett, of Lynn; Mr. J. Fowler, architect. The church is heated on the hot-air principle.

Prittlewell.—A fund has been opened for the restoration of the old church at Prittlewell. Mr. Christian, of London, architect, has surveyed and reported upon the edifice. He is of opinion that, if it is desired to restore the church to its original form and beauty, it should be re-roofed and re-seated throughout, for which latter work he has prepared a plan, by which, while giving ample room in the sittings, the accommodation of the building will be increased fully one half. The cost of these works, if carried out in a substantial and durable manner, together with that of the necessary repairs to walls, windows, and tower, and including warming and lighting apparatus, is estimated at nearly 6,000*l.* Towards this sum upwards of 1,400*l.* have been already subscribed.

St. James's Hall.—Mr. Henry Leslie has commenced his spring series of concerts. They comprise concerts of unaccompanied music, by Mr. Henry Leslie's choir, and orchestral and choral performances. The first took place on Thursday evening, the 3rd. March 3rd is the date of the second.

Books Received.

Letter to the Right Hon. the Lord Provost of Edinburgh as to the Sanitary State of the City. By WILLIAM THOMAS THOMSON, F.R.S.E., &c. William Blackwood & Sons, Edinburgh and London. 1870.

MR. THOMSON is, we understand, an eminent Scottish actuary, and manager of the Standard Life Assurance Company. In this letter to the chief magistrate of Edinburgh he points out with peculiar emphasis the causes of the high death-rate of that beautiful city. The gist of his observations may be gathered from the following sentence:—"While we are busily engaged in providing new accommodation for the sick and suffering poor, we are dealing with a section merely of our sanitary requirements. The mere question of site for our hospitals should not, important as it is, absorb all our attention, for hundreds are yearly being cut off around us who would, in all probability, have been now alive if our sanitary regulations had been more perfect, and our advisers more acute and active in their inquiries. The public health is surely a question as large and as important as that of accommodation for our sick poor." The subjects mostly referred to by Mr. Thomson are "overcrowding," "water supply," and "irrigation by sewage."

A History of Lichfield Cathedral, from its Foundation to the Present Time, with a Description of its Architecture and Monuments. By J. B. STONE, F.G.S. London: Longmans & Co. 1870.

LICHFIELD CATHEDRAL, always interesting, has been rendered even more attractive to sight-seers than it was before, by new works and modern adornments. To meet the wants of those who are thus led to descend upon it, Mr. Stone has prepared this volume, in some respects a superior sort of guide-book. It is a pleasant enough popular history of the cathedral, but we have a very strong feeling that, to describe a noble piece of architecture, knowledge of architecture is necessary. Mr. Stone quotes Murray's "Handbook," and quotes Willis; but he apparently knows little of this department of his work himself. The work is very nicely got up, and is illustrated with five charming photographic views.

Wherever any damage is done, the author, like many other antiquaries under the same circumstances, at once ascribes it to the puritan soldiers, the correctness of which ascription is by no means so certain as some assume it to be.

The new pulpit in Lichfield Cathedral, of metal, is probably unique. The principal windows of the choir, it may be remembered, are filled with some remarkable sixteenth-century glass obtained from the dissolved Abbey of Herckenrode, near Liege, through Sir Brooke Boothby.

A pleasant and not unprofitable day may be spent in Lichfield.

VARIORUM.

THE *Quarterly Journal of Science* for January contains some interesting papers,—especially on the Principles and Methods of Sewage Irrigation; on the Total Solar Eclipse of August last, by Mr. Crookes, F.R.S.; and on Light and Sound. The paper on sewage irrigation is entirely in its favour as a solution of the sewage problem. It points out that sewage irrigation is of very ancient origin, not only as a deodoriser and neutraliser of excreta, but as a promoter of vegetation. The recognised power of earth to act as a disinfectant is traceable to the Mosaic lawgiver, as we have ourselves ere now observed; and the King's Garden at Jerusalem in ancient Jewish times appears to have been irrigated by sewage conducted through the rock tunnel sewers which still exist. The author of the paper reviews what has been done in modern times towards the establishment of the system and the application of the sewage to the soil. The paper of Mr. Crookes gives an excellent review of the observations of astronomers on the late total eclipse of the sun. It is accompanied by coloured and other diagrams of special interest. There is one point, not seemingly noticed by astronomers, to which we should like to draw Mr. Crookes's attention, if we may presume to do so. In the large coloured diagram, that "strange phenomenon, the corona," as Mr. Crookes calls it, has this peculiarity, that its

greatest breadth lies exactly in the line of the moon's path, whilst its narrowest breadth lies at right angles to that line. Does not this peculiarity denote a special relationship to the moon rather than to the sun, to which the tendency of astronomers at present seems to be to refer all these remarkable phenomena? Moreover, even the roseate and cloud-like protuberances seem to be arranged in a similar way; that is, they lie more on the line of the moon's path, than *at right angles with it* in the total eclipse. As regards the corona, would not the peculiarity just noted, as well as its existence at all, be explicable if we stipulate the existence of a lunar atmosphere, and perhaps an ocean as well, impelled, by the centrifugal force, to the outward and unseen hemisphere of the moon? This atmosphere and ocean, with perhaps cirrous clouds floating in the atmosphere, would seem to be just such a condition of things as would produce that brilliant silvery white irradiation, with radial striæ, "of a fibrous, slightly curled or twisted character, somewhat like a cirrous cloud." And would not the form of the lunar atmosphere be modified by the moon's onward motion, so as to be narrower at right angles to the path than in a line with it? The fact that the roseate protuberances appeared partially projected *on the face* of the black disc of the moon, surely itself implies the existence of a refracting atmosphere behind or on the far side of the moon, and through which these cloud-images have passed. The idea that the red protuberances are clouds rather than flames, as we ventured to suggest previous to the last eclipse, appears to be now fully recognised; although the fact that similar clouds (or flames) have been seen surrounding the sun, apart from eclipses, would seem still to be held to corroborate the idea that they exclusively belong to the sun, and none of them to the moon. In speaking of Professor Zöllner's remarks on the protuberances, Mr. Crookes says,—

"In comparing the general impression of the protuberances with terrestrial phenomena, the author states that the great majority remind him of the different forms of our clouds and fogs. The cumulus type is completely developed in the cases here referred to. Other formations remind us of masses of clouds and fogs floating closely over low lands and seas, whose upper parts are driven and torn by currents of air, and which present the well-known, ever-varying forms when viewed from the tops of high mountains."

There is not much indication here of a "fiery" sun, or of "solar flames," nine or ten thousand miles high and forty thousand long! —— "London Water-supply, from the Sources of the Wye, in South Wales. By H. H. Fulton, C.E. London: Stanford." Mr. Fulton's scheme is to fetch a supply of fine soft water to the different water companies of London from the sparsely populated district of the sources of the Wye, in South Wales, by gravitation. To bring 130 million gallons a day, as a portion of the scheme, he estimates would cost 7,000,000*l.*; and the entire scheme, for 230 million gallons a day, it is estimated would cost 9,000,000*l.* The serious dearth of employment at present, he remarks, renders this a fitting time to carry out such a scheme.——"The Australian Handbook and Almanac for 1870. Gordon & Gotch, Holborn-hill." The idea of this almanac is a good one: it contains a good deal of information on the Australasian colonies, besides the usual matter of a shilling almanac. —— "England at Home. By W. E. Littlewood, M.A. London: Cassell & Co." This is one of Messrs. Cassell, Petter, & Galpin's little school-books, and contains a very brief and familiar description of the principal physical, social, commercial, and topographical features of England and Wales. The author was himself the head-master of a school and author of an Elementary British History.——"The Useful Weather Guide for the first Six Months of 1870. By Eleanor Rugg Byrne. London: Spon." The object of this guide is said to be "to suggest to the observer such weather as will [perhaps?] prevail at the time of the moon's entrance into her half quarters, quarters, full, and change; showing the moon's influence on the atmosphere, and representing the variations of the weather by morning and afternoon indicators."——The *City Press* has a readable and sensible article on the Architecture of the City.

Society of Engineers.—At the next ordinary meeting of the society, to be held on the 7th inst., the president will present the premiums awarded for papers read during the year 1869, and will deliver his inaugural address.

Miscellanea.

Reclamation of Land.—In Tattershall parish are hundreds of acres of waste land, producing food for neither man nor beast—a dreary moorland, where wild grass and ling grow feebly between the roots of Scotch fir-trees cut down some years since. This land, although never heretofore worth sixpence an acre, has been ascertained to be capable of bearing good root crops when properly cleared, drained, and clayed. Small attempts have from time to time been made in this direction with more or less success, the chief obstacle being the great expense of manual and horse labour in digging out and carting away the roots of the trees. According to the *Lincoln Mercury*, it has been reserved for Mr. John Robert Bankes, Lord Fortescue's agent and steward, to attempt a bolder experiment by calling in the power of steam to free the land from roots and plough the ground. After a consultation with Mr. Toepffer, of the North Lincolnshire Steam Cultivating Company, Mr. Bankes made a contract with him, and allotted the company a tract of ground on which to commence operations. The land, which is of a light, sandy, and gravelly nature, is studded with the stumps of Scotch fir trees, about 8 ft. or 10 ft. apart, in rows at the same distance from each other: most of the trees have been at the base 12 in. to 20 in. in diameter. When fairly at work, two engines extract the roots, pulled at the rate of one a minute. Two other engines of less power are engaged in drawing the released roots off the land into large heaps (to be burnt when the dry weather comes, if not worth removing), and thus preparing the land for the six-furrow plough which stands close by.

The Habits of Workmen.—The *Scientific Review* says,—"The careless and slovenly habits which are met with amongst a very large proportion of workmen is referred to in the *Scientific American*, in strong, though it must be admitted not altogether unjustifiable, terms. The shops, it is observed, in which cleanliness and order prevail are rather the exception than the rule; and the individual workman who, in the midst of all the carelessness which prevails in this regard, maintains a scrupulous care for personal cleanliness, order in the arrangement of his tools, and method in the performance of his work, may be regarded as a rising man. On our occasional journeys at times when workmen are returning from their daily work, we frequently notice them with begrimed faces and smutty hands, on their way to homes perhaps no less attractive than their persons. If this were compelled by circumstances, and the unavoidable conditions of their toil, it would be unkind indeed to find fault with it. We should, indeed, be the very last to look down upon the necessary accessories of honest toil; and if any workman is so situated that he must utterly disregard cleanliness, let it be distinctly understood we do not complain of him. But cases of this kind are rare, if they exist at all. What, then, is the reason for the inexcusable slovenliness of a large majority of workmen?"

The Post-Office Telegraphs.—An official notice has been issued by the Postmaster-General that on (this) Saturday, the 5th inst., the transfer of the property of the Telegraph Companies to the Postmaster-General will have been completed, and on and from that day the conduct of telegraph business within the United Kingdom will be undertaken by the Post-office. A list of the postal telegraph offices, which will on that day be opened to the public will be then ready for exhibition to the public at all post-offices in the United Kingdom. The postal telegraphic system will be extended as rapidly as circumstances will permit, and due notice will be given from month to month of the opening of additional offices. The charge for the transmission of an inland message will be uniformly, and without regard to distance, 1s. for the first 20 words, exclusive of the address, for which no charge will be made, and 3d. for each additional five words or part of five words. The message forms for inland messages will be of two kinds, viz., forms with a 1s. stamp embossed thereon, and forms without any such stamp.

The Henley-on-Thames Town Surveyorship.—The election of Town Surveyor to this place has been finally decided by the Local Board in favour of Mr. Frederic Haslam.

Dr. Lyon Playfair on Technical Education.—Dr. Lyon Playfair, M.P., in his second lecture on education to the members of the Edinburgh Philosophical Institution, confined himself mainly to technical instruction. He contrasted the educational efforts made and the results attained by various Continental States—Switzerland especially—with the paltry provision made by the British Government for the instruction of the working classes. The limitation of the Revised Code to the three R.s rendered it useless for the purposes of that section of the community; an elementary knowledge of the principles of science and art involved in the occupations of the people should be introduced into primary schools, and indirect compulsory education of a primary character should be secured by making it a condition of the employment of the poor. When elementary education was made the key for entering workshops, then the schools attached to them should be made secondary, and afford instruction applicable to the employments in which the pupils were engaged. A higher education in relation to the industries of the people was an essential for the continued prosperity of the nation.

Metropolitan Municipal Association.—A meeting was held on Monday in last week, at the Rooms of the Association, 209, Piccadilly, to consider amendments to the proposed Bills, and to meet objections urged in the last debate in Parliament. Objection had been taken to the number of mayors and aldermen proposed to be created in the Bills, and the discussion mainly turned on the means to establish both local municipalities and one central in London, in which the local should be neither too weak nor too strong in connexion with the chief municipality, but strong and harmonious as parts of a great whole. The example of Manchester, with its various townships in union, was much relied on. The decision was in favour of proceeding with the Corporation of London Bill to establish one municipality for London. The creation of local municipalities, it was suggested, should be as minor parts of a great whole. The true policy was levelling up, and the rest of the metropolis placed on the City footing. The committee authorised a revision of the Bills as modified by the discussion. The Government would support the second reading of the Bills. It was estimated that at least 2,000*l.* must be forthcoming, and an appeal for assistance is to be made.

The Improved Industrial Dwellings Company.—The directors, in the report of their proceedings for the half-year commencing 1st July, and ending 31st December, 1869, state that a further sum of 67*l.* 19s. has been expended on buildings now completed, and 6,736*l.* 9s. 1d. on works in progress, making an expenditure of 6,804*l.* 8s. 1d. during the past half-year, and a total expenditure of 133,855*l.* 0s. 3d. since the formation of the company, on capital account. The gross rents received during the past half-year amount to 6,657*l.* 7s. 10d.; and after paying all charges, and crediting the proper amounts to the repairs and leasehold redemption funds, there is a net profit of 3,606*l.* 10s. 7½d. The sum of 5,229*l.* 13s. 7½d., which includes 1,623*l.* 3s. brought forward from the last half-year, is available for division among the shareholders, but the directors recommend that a dividend at the rate of 5 per cent. per annum only be paid,—which will absorb the sum of 2,944*l.* 13s. 9d., and that the balance, viz., 2,284*l.* 19s. 10½d. be carried forward.

A Mental Calculator.—John Alexander, post-runner between Nairn and Cawdor, according to the *Elgin Courant*, has proved himself to be an extraordinary mental calculator. He has given the correct answers to questions such as the following in less than a minute:—"Two chests tea, each 80 lb., at 3s. 6½d.; 12 bars brown soap, each 3½ lb., at 4½d.; 17 bars white soap, each 4 lb., at 5½d.; three bags sago, each 27 lb., at 4½d.; and seven bags barley, each 19 lb., at 1½d." He was asked how many letters there would be in a year's file of a daily newspaper of eight pages, each seven columns, each 190 lines, each forty-two letters? The answer, 139,873,440, was given in a few seconds.

Society for the Encouragement of the Fine Arts.—The first special meeting of the session took place on Thursday last, at the House in Conduit-street, when an exhibition was made of some of the works of the late Mr. F. Y. Hurlstone. The President of the Royal Academy was to preside.

Street Improvements in Leeds: Corporation Sales.—The seventh sale of building land for the corporation of Leeds, in connexion with street extension, has taken place. There was a large and influential attendance, and Mr. Hepper, auctioneer, offered the various lots. Lot 1 was a corner site, opposite Trinity-street, having a frontage of 16 ft. 6 in. to Boar-lane, with a depth of 63 ft., the total area being 150½ square yards, or thereabouts. The first bid was 21*l.* per yard; the highest, 23*l.* 10s., and therefore the lot was withdrawn. Other two lots were also put up, but withdrawn. The next lot offered was a corner site opposite Trinity Church, and excited some spirited bidding. It has a frontage to Boar-lane of 11 ft., and to the roadway on the west of 18 ft., with a depth of about 24 ft., and containing 28 square yards, exclusive of roads and causeways. The first offer was 20*l.* per yard, and it was ultimately knocked down at 33*l.* 10s., the buyer being a wholesale druggist. One or two more lots were also withdrawn.

New Carving Machine.—In the machine invented by Mr. Gear, of Newhaven, U.S., the wood to be carved is fastened firmly to the bed by movable clamps adjustable to suit any required size of wood, and the cutters are fastened to a spindle moved by a universal joint in any direction upon the bed of the machine. The cutter is guided by hand, the guide resting against the pattern. The carving can be gauged to any required depth, and made to conform to any required pattern. A fan blows away chips as fast as they are produced, leaving the work constantly in view of the operator. The same tool which cuts the mortise also cuts the tenon, the two pieces of work to be dovetailed being clamped together to the end of the table. Every kind of finish hitherto made upon the edges of lumber, and which has hitherto been mitred and glued upon the face to create a finish, is planed, beaded, and moulded upon the piece itself by this machine.

Work and Wages in America.—It appears that since the civil war there are great complaints as to the quantity of work per day done by artisans and others in the various States throughout the country. The diminution is variously estimated in the different localities at a fourth, a third, and so on, of the work done previous to the war. The wages during the war, and even now, are higher than they were before the war; but it is said that the men are dissatisfied because everything is so much dearer (on account of these very wages chiefly) that they consider themselves worse off than they were. On the other hand, there is a very general movement throughout the country for a reduction of the present wages. These wages are injuring the masters, it is stated, no less than the men, and it is to be hoped the latter will see that the reduction will be to their advantage no less than that of the masters, since they complain of the dearness of everything, just as the masters do of the want of business.

Safety of Old Warehouses and Public Resorts, Liverpool.—At a special meeting of the town-council, the mayor said he might throw out a hint regarding two points which the corporate body of Liverpool might with advantage bear in mind on next going to Parliament. They should consider how far the council ought to take supervision in respect to the safety of warehouses—particularly the old warehouses throughout the borough of Liverpool. If a man erected a warehouse, particularly for corn, there was no limit as to the weight he should put into the room. He also thought it might be within the scope of their duty as a municipal body to see that there were proper and sufficient modes of ingress and egress connected with buildings where large masses of people were in the habit of assembling. He thought these two points were well worthy of the future consideration of the council.

How to make Artificial Porphyry.—The *Chemical News*, giving an abstract of a recent paper by MM. Sepulchre and Ohressen, says that these *savants* have perfectly succeeded in utilising the slag of the iron blast furnaces for the manufacture of paving stones, which withstand a crushing weight of more than 400 kilos. per square centim., and have answered for the purpose of paving several streets at Brussels and Paris, and stood heavy traffic far better than even the celebrated Quenast stones. The streets paved with this material at Brussels have a heavy gradient.

New Reservoir for Oswestry.—By the recent decision of the town council, the borough surveyor, Mr. E. B. Smith, has been charged with the construction of the new reservoir, capable of storing between six and seven million gallons of water, making, with the present reservoir storage, ten million gallons. The works have been commenced, and there are now about forty men engaged in the excavations, and certain other preliminary works, before the full staff of men are put on. The excavations are being made through a bed of blue clay, which will afterwards be utilised, by making it into bricks. There are upwards of 40,000 cubic yards of earth and clay in all to be removed.

Explosion of a Boiler in the South of England.—An explosion has occurred at a boarding-school, Ashley House, Gateford-road, Worksop, which killed a female servant on the spot, and also severely injured another person, so that she is not likely to live. The boiler which exploded was supplied with water-pipes, and fixed in the wash-house, which is divided by a passage leading to a play-ground from the house kitchen. The roof was blown off the wash-house, and a partition wall destroyed. The place was a complete wreck. We have had no reply yet to our query why so many more of these explosions occur in the north than in the south of England.

Proposed New Street from Charing-Cross to Tottenham-court-road.—A joint deputation from the parishes of St. James, Westminster, St. Margaret and St. John, Westminster, and St. Anne, Westminster, waited on the First Commissioner of Works to urge upon the Government the propriety of making a communication between Pall-Mall and Leicester-square, along the west front of the New National Gallery. The First Commissioner stated that it was not the present intention of the Government to build any west front to the National Gallery, but that if the Metropolitan Board of Works, or any local boards, proposed to make a good street to Leicester-square in that direction, they would take the matter into consideration and modify their plans if possible so as to allow the street to be made. This ought to be taken in hand at once.

Hoisting the Great Bell of Worcester Cathedral.—This bell has been successfully hoisted into the tower of the cathedral. The bell weighs 4½ tons, but it was got up to its proper position with comparative ease by the aid of three powerful crabs worked by several strong men. The Earl of Dudley, Lord Elcho, the Rev. R. Cattley, and several gentlemen of the city and neighbourhood were present at the hoisting of the bell, and much interest was taken in the method adopted. Lord Dudley, before leaving, presented the workmen with a sum of money, and also promised a further donation to the Clock and Bells Fund of 100*l.* The twelve other bells composing the peal are all hung ready for work.

Linlithgow Parish Church.—Attention has been directed of late to the propriety of restoring this ancient and beautiful ecclesiastical building to something resembling its former condition. Encouraged by the success attending the improvements made in the Glasgow Cathedral and the High Church at Stirling,—the latter, by the way, bearing a strong resemblance in many points to the church of Linlithgow,—it has been resolved to make an effort, and strive, if possible, to have the interior of the church, as it exists at present, altered and re-arranged. It has been announced that Mr. David Hutcheson, of the firm of David Hutcheson & Co., Glasgow, has offered to subscribe the sum of 500*l.* towards the contemplated restoration.

Italy and the Workmen's International Exhibition.—The Florence journals publish a circular, addressed by the Italian Commission for promoting the London Workmen's International Exhibition of next July, to the various municipalities, presidents of the Chambers of Commerce, and managing committees of working men's clubs, throughout the Peninsula. Of this commission, the Marquis Rudini, the late Minister of the Interior, is the president.

Carpenters' Company.—There is a vacancy in this company's almshouses at Twickenham, for a freeman or liveryman, aged fifty-five, or a widow of a freeman or liveryman, aged fifty. Applications to be sent to the hall before 26th February.

Abandonment of Improvements at Liverpool.—The Liverpool town council, in consideration of the present heavy local taxation, have now resolved to withdraw their Improvement Bill, prepared for the ensuing session, involving an expenditure of over 500,000*l.*, it being understood that next year they will expend upon improvements about 100,000*l.*, for which they have already procured powers. In the course of the discussion, it was stated that the mortgage debt of the corporation amounts to 1,324,464*l.*, the interest on which requires 10d. in the pound out of the rates.

Use of Steam in Brick-kilns.—Among recent American inventions is one which consists in so constructing a brick that the products of combustion from fires contained in furnaces at one end of the kiln are caused to forcibly permeate the mass of bricks by the action of jets of steam or other equivalent exhausting device, situated at the opposite end of the kiln, and *vice versa*. Jets of steam are also directed into the combustion chambers, and over the fuel of those fireplaces which are in action for the time being, as well as into their corresponding ash-pits.

Crystal Palace.—Next Tuesday, besides the Pantomime and the performances of the American skaters, the annual show of the National Peristeronic Society will be held in the Tropical Department. From the title of this amateur association few people probably understand that its objects are to improve the breed of pigeons, and by holding these annual exhibitions, to enable pigeon-keepers to improve their collections. The show is of an interesting character.

Cologne Cathedral.—The progress made in the construction of Cologne Cathedral during the year 1869 was satisfactory. The northern tower has reached a height of 180 ft. above the ground. The state of the southern part was so bad that a great deal of the masonry had to be removed; 20 ft., however, have been rebuilt. The scaffolding for 1870 is almost ready, and the stone required has been purchased. The towers will now rise isolated above the building. They are to be built to a height of 30 ft. a year.

Proposed Church of St. Paul, Leicester: Church Extension Association.—The Building Committee met last week to open tenders for the erection of this church. The following were the tenders:—Bradley, 6,467*l.*; Myers, 5,849*l.*; Jackson, 5,758*l.*; Dove, 5,475; Widdowson, 5,250*l.*; Firn, 4,867*l.*; Neale, 4,765*l.*; Osborn, Brothers, 4,436*l.* The lowest tender will be, of course, accepted, on the requirements of the architect being complied with. The work will, therefore, again fall into the hands of a local firm.

Art-Workmen.—The response made to the prizes offered by the Society of Arts for specimens of art-workmanship is in some respects better than it was last year. The catalogue will be out next week. The same gentlemen who have before acted, Sir M. D. Wyatt, Mr. Redgrave, and Mr. Godwin, with a fourth not yet named, will report on the works for the assistance of the council in adjudicating the prizes.

Test for Hardness of Metal.—The hardness of metals may now be ascertained by aid of an instrument invented by a French engineer. It consists of a drill, turned by a machine of a certain and uniform strength. The instrument indicates the number of revolutions made by the drill. From this, compared with the length of bore-hole produced, the hardness of the metal is estimated. It is said that a great proportion of the rails now employed in France are tested by this instrument.

Fall of a Railway Bridge.—An alarming accident has occurred at Ingham. Several men were repairing a bridge which belongs to the Thetford Railway Company, and had been badly built. Just as the men were about to leave off work for dinner, a train is said to have passed, when the bridge gave way, and fell with a loud crash into the street below. All the men escaped serious injury except a bricklayer, who was severely hurt.

King's College Girders.—We were present a few days ago, with Mr. C. J. Freake, Mr. E. Beckett Denison, and others, when Mr. George Dines, to whom the restoration of the damage at King's College Dining-hall has been intrusted, broke two of the old girders to learn their strength. As a few diagrams will make the matter clearer, we defer mentioning the result till these can be prepared.

New Dock for Liverpool.—The Mersey Dock Board, after a protracted debate, have resolved, by 17 to 6 votes, to construct a new dock for the steam trade at the north end of the port. The estimated cost is 150,000*l*. The minority wanted by differential rates to utilise the Birkenhead Docks.

New Covered Market for Preston.—At the meeting of the Preston town council, on Thursday last, it was unanimously decided to erect a new covered market, the cost of which is estimated to be between 6,000*l*. and 7,000*l*.

The French Academy.—We learn from the *Art-Journal* that Mr. J. R. Herbert, R.A., has been elected a corresponding member of the French Academy of *Beaux-Arts* in the room of the late Baron Leys, of Antwerp.

Society of Female Artists.—The exhibition made by this society will be opened to private view on the 12th inst., and to the public on the 14th.

Female School of Art.—The distribution of medals and prizes will take place in the New Lecture Theatre, South Kensington, on the 9th inst. Sir Stafford Northcote will preside.

The Free Libraries Act.—At Willenhall a public meeting has been held, at which, after a good deal of discussion, the Free Libraries Act has been adopted, by a majority of 93 to 41.

TENDERS.

For four houses at Southend. Mr. C. Kirkby, architect. Quantities supplied by Mr. F. Johnstone :—

Whur	£1,790 11 0
Wicks & Bang	1,700 0 0
Pelling	1,600 0 0
Allen	1,462 13 0
Smith (accepted)	1,251 0 0

For a Wesleyan meeting-house, Weeley, Essex. Mr. John Leaning, architect :—

Dobson	£369 0 0
Canham	341 0 0
Shepherd	340 0 0
Everett & Son	318 0 0
Saunders & Son	308 0 0

For villa residence at Richmond, Surrey, for Mr. James Alabaster. Mr. G. H. Page, architect. Quantities supplied :—

Sweet & Son	£1,624 0 0
Gasscone	1,550 0 0
Aries	1,530 0 0
A. & J. Smith	1,477 0 0
Brown & Sons	1,475 0 0
Bass (accepted)	1,460 0 0

For carcasses of twenty-two houses, at Leyton, Essex, for Mr. J. D. Meads. Messrs. John M. Dean & Kingdon, architects :—

Hunt & Elkington	£3,500 0 0
Davis	3,410 0 0
Turner	3,300 0 0
Cardoza	3,113 0 0
Boyer	3,090 0 0
Fisher	2,990 0 0
Fought	2,956 0 0
Aitcheson & Walker	2,860 0 0
Holding & Dickens	2,820 0 0
Kelly	2,817 0 0
Ingham	2,795 0 0
Mansfield	2,735 0 0
Bates	2,640 0 0
Finch	2,634 0 0
Russell & Parsons	2,618 0 0
Brickell	2,420 0 0
Barnes	2,400 0 0
Ladd	2,300 0 0

For three new warehouses in the City. Mr. Hill, architect. Quantities supplied by Mr. Joseph Gibson :—

Browne (accepted)	£6,943 0 0

For new farmhouse and homestead, Little Wenham Hall, Essex, for Mr. Joseph Baxendale. Mr. Fred. Chancellor, architect. No quantities supplied :—

Brown	£3,160 0 0
Saundars	3,112 0 0
Bell & Sons	2,964 0 0
Glasscock	2,905 0 0
Cole, Brothers (accepted)	2,783 15 0

For four new warehouses in Oak-lane, City, for Messrs. Knight, Wells, & Braham. Mr. Fred. Chancellor, architect. Quantities supplied by Messrs. Karslake and Mortimer :—

Turner & Sons	£8,997 0 0
Brown	8,800 0 0
Gammon & Son	8,751 0 0
Conder	8,450 0 0
Rider & Son	8,375 0 0
Colls & Son	8,100 0 0
Henshaw	7,989 0 0
Hill, Keddall, & Co.	7,815 0 0
Browne & Robinson	7,790 0 0
Brass	7,738 0 0
Hill & Sons	7,520 0 0
Crabb & Vaughan (accepted)	7,218 0 0

For taking down and rebuilding the Dover Castle public house, Church-street, Greenwich. Messrs. Church & Rickwood, architects :—

Vaughan (accepted)	£990 0 0

For a detached residence to be built in The Avenue, Blackheath, for Mr. D. Davis. Messrs. Church & Rickwood, architects. Quantities supplied :—

Anley	£1,688 0 0
Tongue	1,550 0 0
Pinkey	1,527 0 0
Blake (accepted)	1,444 0 0

For lairs and slaughter-houses, for the Town-hall and Markets Committee of the Borough of Salford. Mr. John Bowden, C.E., architect. Quantities supplied :—

Squires	£3,215 0 0
Yates	3,027 0 0
Johnson	2,814 0 0
Parry & Son	2,773 0 0
Simpson	2,690 0 0
Neill & Son	2,684 0 0
Ledger	2,650 0 0
Wade, Brothers	2,586 0 0
Jackson	2,575 0 0
Forkington & Son	2,522 0 0
Statham & Sons	2,485 0 0
Wilkinson & Helm	2,475 0 0
Warburton, Brothers (accepted)	2,450 0 0

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Young (accepted)	436 0 0

West Hill Estate, Wandsworth.—Roads.

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Robinson	2,050 0 0
Wigmore (accepted)	1,725 10 0

Muswell Hill Estate.—Drainage and Road Works.

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Strickson (accepted)	740 0 0

West London Estate, No. 2.—Drainage and Road Work.

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Young	530 0 0
Strickson	500 0 0
Coker, jun.	490 10 0
Wigmore	450 0 0
Blackmore (accepted)	423 0 0

Hammersmith Estate.—Drainage and Road Works.

Strickson	£700 0 0
Coker, jun.	695 0 0
Blackmore	670 0 0
Wigmore	600 0 0
Young	588 0 0
Pizzey (accepted)	531 0 0

TO CORRESPONDENTS.

In type.—Registration of Disease; Death by Suffocation; &c.—Beta (we do not know any agency in London for the negotiation of architectural partnerships).—E. P. (all in good time).—M. & W. (tenders were not enclosed).—W. C. (if query reached us, and we did not insert it, there was reason for doing so).—F. H. G. (shall hear from us).—Z. (correspondents should not be impatient: the mass of information received from all parts of the kingdom often makes postponement unavoidable).—A. G. H.—J. W. H.—H. H. S.—B.—Messrs. P.—C. K.—W.—T. M.—W. F. C.—A. M.—Miss W.—I. W.—J. H.—T. V.—J. L.—W. W.—A. B.—G. A.—L.—J. W.—W. H. E.—E. W.—G. D.—E. J.—L. B. & W.—B. B.—H. L.—C. H. H.—D. & K.—N. A. H.—T. C.—A. H.—Col. P.—J. S. N.—G. W. H.—W. E.—T. V.—C. C. H.—F. C.—J. G.—J. W. T.—E. R.—T. B.—B.—J. B.—W. C. R.—T. H. V.—B. & Co.—W. F. C.—C. C. G.—P.—R. T.—J. F.—G. D. R.

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Borough of Tynemouth, 2nd February, 1870.

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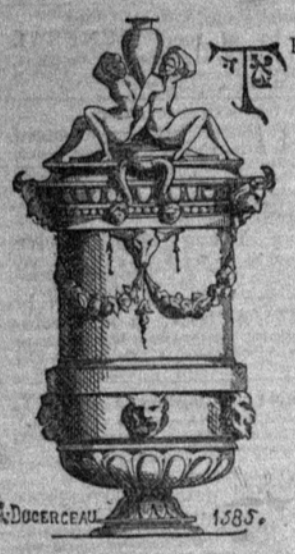
The Builder.

VOL. XXVIII.—No. 1410.

A Visit to Bethlehem.



THE most sacred spot on earth after Jerusalem, the place of sepulture of our Lord, is Bethlehem, His birthplace. There are doubts about the exact site of the holy sepulchre, but the same degree of uncertainty does not exist about the grotto of the Nativity. It has been urged by some that a cave underground could not have been used as a stable; but those who have travelled in the East will be able to remember many towns and villages built upon rock in and around which are caves used by the inhabitants as stables and pens, for their horses, asses, cows, and sheep. The fact of the grotto being underground is easily explained when we consider that even in the course of a century the level of the ground in the vicinity of the dwellings of men is perceptibly raised by the accumulation of *débris* of all sorts, and that therefore in the three hundred years which elapsed between the commencement of the Christian era and the period when St. Helena erected the basilica over the grotto, there must have been some such raising of the soil. We know that this was the case at Jerusalem, and that the holy sepulchre was buried beneath heaps of rubbish until the time of the Empress's visit. Then everything was cleared away, and the rock cut to a level all round, to admit of the erection of a sanctuary surrounding the tomb; but here the Empress or her architect found it a better plan to build over than around the grotto, in such a manner that the high altar should stand above it. In addition to the evidence of common sense, we have the testimony of reiterated tradition in support o the authenticity of the site.

But beyond the sacred associations connected with the place, it has an especial interest for the architect, arising from the fact that the church itself is the earliest basilica in existence, and the only one which has come down to us in an unaltered condition.

Sta. Maria Maggiore and San Giovanni in Laterano have been so frequently rebuilt, and are so overloaded with extravagant ornamentation, that but little can be traced of the original structures beyond the plan. San Paulo fuori le Mure, as we know, has been lately reconstructed. San Clemente and Sta. Agnese preserved many of their primitive features, but have still endured many alterations since the time of their foundation; and the Church of the Holy Apostles, built by Constantine in New Rome, and his basilica at Jerusalem, have totally disappeared; but the church of Bethlehem remains as it was left by the Empress; the only addition being the internal mosaics of the twelfth century, a modern roof, and a monstrous wall, which has been built between the nave and transepts as a barrier,—a practical and tangible excommunication of the Greeks by the Latins, or of the Latins by the Greeks.

Perhaps the church owes its preservation to its being situated in a village and not in a city, as in the case of many of our village churches, which have escaped; while our cathedrals, one and all, have suffered at the hands of the destroyer or *soi-disant* restorer. We remember, on the occasion of a visit to the Church of Dôl, in Brittany—a cathedral situated in a small town,—being delighted with its untouched condition. No new work was to be seen either inside or out, and the columns of the nave had here and there an attractive tint of green mould on them. The worthy curé, who accompanied us, did not, however, share our gratification. Our town is unfortunately so poor, said he, that we cannot raise a sufficient sum to enable us to gain a grant for the restoration from Government. "*Tant mieux pour vous et pour votre église*," was all we could say to our astonished cicerone. His mind, like that of many other pastors, both in France and England, was bent upon the attainment of something new,—of scraped walls and mouldings, dainty tiles and tawdry decorations, and the classification of his church as a *monument historique*. Like the Cathedral of Dôl, the basilica of Bethlehem probably escaped on account of its somewhat remote position in a poor village.

Such being the nature of the interest attached to Bethlehem, our readers, probably, will not object to accompany us on an excursion thither. Bethlehem is only about two hours' ride from Jerusalem, and the trip may be made in peaceful times without an escort,—at least, we found by experience that it could be; and since the time of our visit, we hear that the Bedouins do not, as they did formerly, approach the walls of the Holy City, and pick up the incautious stragglers, being deterred by a wholesome dread of the breech-loaders with which the Turkish army is in part armed.

We left Jerusalem by the Jaffa Gate; but instead of following the Jaffa road, which runs beside the city walls, and then turns to the right over a high ridge, we descended into the valley on our left, and after passing an empty reservoir, the Birket Es Sultan, at the bottom of the valley, began to ascend near a row of ugly cottages, built by that benefactor of his race, Sir Moses Montefiore, as almshouses for his poorer compatriots, and so reached the summit of the hill situated on the south-east side of Jerusalem, adjoining that of the Hill of Evil Counsel. On turning round towards the Holy City, we had a view, interesting indeed, but inferior in interest and in beauty to that which is obtained from the Mount of Olives. Before us lay a ravine, the valley of Hinnom (on the sides of which grew a few scattered olive-trees), which deepened as it proceeded towards our right; and immediately opposite, upon a rocky eminence, about as high as that on which we stood, was the south-east angle of the city walls. Not far from the angle rose the towers of the Citadel of David, and in front of the wall, on the shoulder of a hill, stood the building dignified by the title of the House of the Last Supper. Immediately inside the walls were the roofs of the Armenian convent; but few roofs or minarets were visible as the city falls off from this, its highest point, towards the valley of the Tyropœon.

Pursuing our road towards the east, we soon came upon a tract of barren table-land, through the midst of which the road ran in a straight line. This plain was treeless, and at the season in which we visited it—autumn—without signs of vegetation; so that we were not at all sorry, after about three-quarters of an hour's ride, to reach a wood by the road-side, in which we saw one or two encampments occupied by consuls, who wisely take advantage of the fine autumnal weather to get away from the dust, dirt, heat, and bad water, all which, towards the end of September, render a residence within the city-walls almost insupportable. Opposite the wood was a large Greek convent, dedicated, like many of the Greek churches, to the Prophet Elias, who is especially venerated by that community.

At this point we turned to the right, and entered a road running along a ridge, and skirting a deep ravine which lay on our left hand. We soon observed on our right a small domed building,—of no great antiquity itself, but marking the site of one of the landmarks of the ancient world,—Rachel's Tomb, about the situation of which Christians, Jews, and Mahometans are for once agreed.

A little beyond this point we saw, crowning the summit of the opposite side of the ravine,—which, on account of its numerous terraces covered with vineyards, presented a striking contrast to the valley we had left an hour or so before,—the village of Bethlehem, which no doubt obtained its name,—signifying in Hebrew, house of bread, and in Arabic, house of meat,—from the fertility of the district in which it is situated. Conspicuous amongst the buildings was a vast buttressed edifice at the edge of the ravine,—the Convent of the Nativity,—which no doubt will be the principal feature in Holman Hunt's forthcoming view of Bethlehem.

In half-an-hour's time after our first view of it we reached the village, and seeing no visible sign of the Basilica, we made our way to the convent, and, upon stating our wishes, were immediately conducted to the guest-chamber. On our way thither we passed through a bare-looking cloister, the floor of which was stained with the purple juice of the grape. A sturdy peasant, with naked feet, was employed in treading out grapes in a large wooden trough, and this view of the preparatory process did not certainly act as a shoeing-horn when we had wine set before us by the hospitable monks.

We were agreeably surprised to encounter in the guest-chamber two Englishmen who had accompanied us in our ride round Jerusalem some days before. They, however, had done all the sight-seeing, and were on the point of departure for the Dead Sea; so that we had not the pleasure of their company in the church. As soon as we had finished our frugal repast, we followed the monk who had been deputed to guide us through the cloisters and surrounding chapels, and finally emerged on the south side of the chancel of the basilica. Here we must confess that at first we had some difficulty in orientating ourselves, as the monstrous wall-screen before mentioned as cutting off the nave from the transepts had quite altered the internal aspect of the church. Entering a small door in the wall of the substructure of the choir, we descended by a flight of eighteen or twenty steps to the grotto of the Nativity, which is situated, as far as we could judge, under the high altar. This grotto has been so frequently described, and with such accuracy, that we need only say that it is a natural cave, about 36 ft. long by 12 ft. wide, and 9 ft. high, and that it has been so thoroughly cased with marble that but little, if any, of the live rock is visible. Another staircase led us past other chapels and caves into the opposite side of the church to that from which we had descended. Here we had an opportunity of examining the building more at our leisure. It is cruciform in plan. There is a wide nave, with double aisles, and eleven bays, marked by monolithic columns, about 18 ft. high, with Corinthian capitals and bases. The columns support a regular entablature, consisting of an architrave of three faces; a frieze, enriched with sculptured foliage, and a rich cornice. The capitals are quite classical in character, and would not have disgraced a purer period of architecture; but the overloading of ornament on the frieze and cornice shows a considerable departure from the simplicity of earlier times. The transepts are of the same width as the nave, and terminate at the north and south ends

in semicircular apses. The choir has two bays with aisles, like those in the nave; at the east end is a semicircular apse. There is a row of plain windows in the clearstory. The wall space above the architrave and between the windows is occupied by a series of mosaics, representing biblical subjects, executed in the twelfth century. The roof, which is of cedar, is of the sixteenth century.

It is almost superfluous to allude to the statement made by some authors, upon the authority of Monkish historians, that the church was rebuilt by Justinian; for, as will be perceived from the foregoing description, the character of the architecture entirely contradicts it. The trabeate system here observable died out in the time of Constantine, and was replaced by the arcuate system, which became universal before the time of Justinian. In truth, the architecture of the basilica approaches good Græco-Roman more than that of any other edifice erected in Constantine's reign; and in style it is superior to the contemporary buildings at Rome and Constantinople; for in those cities the materials employed in the erection of new edifices were taken from the temple and other ancient structures: consequently, we find in them capitals and bases too large, or too small, for their respective columns, and architraves, friezes, and cornices squeezed into positions for which they were never intended; while at Bethlehem the columns, which are all monoliths, were evidently quarried in the neighbourhood, and the capitals sculptured to fit them near the building for which they were destined.

There has been an atrium before the church, but there are few traces of it now.

Upon entering the nave, we were surrounded by a crowd of boisterous ragamuffins, who seemed to think it was our bounden duty to purchase their stock of rosaries and carvings in mother of pearl; and who, when we had selected one of the latter, fell upon the favoured mortal who sold it to us with such violence that we could not help exclaiming, as we forced our way through them,—"Are you Christians, and of Bethlehem?"

THE ABNORMAL DEATH-RATE IN EDINBURGH.

THE death-rate is assuming a very serious aspect in Edinburgh. Last week we noticed a letter on the subject, which had been addressed to the Lord Provost (Law) by Mr. Thomson, a Scottish actuary, which showed that the death-rate of Edinburgh for a given period was only exceeded by two of the large cities of Europe, viz., Glasgow and Berlin, the former city being the highest. On the same day of publication it happened that a leading article appeared in the local *Daily Review*, commenting on the sad phenomenon in strong terms; and, from a paragraph in the next column of the same journal, we gather that the author of this article is the editor himself, Mr. Henry Kingsley. The paragraph in question goes on to say that

"Since we wrote the leading article this morning, we find that, for the week ending the 29th of January, Edinburgh has not only surpassed herself, but every other city in Europe. The death-rate here is 47, while Glasgow is only 38, Berlin 30, London 26, and Portsmouth 20. We also now know the reason of the hideous mortality at the Abbey, and mean to speak of it. What will be the death-rate in the new workmen's houses which are building in that quarter?"

Once more, still on the same day, the *Scotsman* gives prominence to the following paragraph, which, while admitting the truth of the weekly statistical returns of the medical officer of health, tries—unsuccessfully, as we think,—to palliate their logical effect by an attempt to deny the truth of the census returns of 1861!—

"The high rate of mortality in the city during the week, indicated by the returns published by Dr. Littlejohn, the medical officer of health, has created a good deal of anxiety in the public mind, and it may not be out of place to call attention to some facts which may tend to allay any uneasiness that may exist. It is now pretty generally admitted that the population of Edinburgh was considerably understated in the last census returns, and consequently any comparison of the death-rate with that of other cities places Edinburgh in a somewhat unfavourable position. A death-rate of 44 per thousand, even putting the population considerably over the present estimate, is, however, considerably in excess of the average; but it will be observed that the proportion of preventible diseases is considerably lower than usual, there being only nine cases of death from fever, six of which occurred in the New and three in the Old Town. The highest death-rate is to be found among the very old and the very young; while there has been an unusually large number of deaths among the pauper population, and those verging on pauperism."

Finally, one or two of the magistrates and town councillors have also printed letters and pamphlets on the subject; and, in fact, the inhabitants of Edinburgh, and the strangers who are resident in that city, seem to have become thoroughly alarmed at this unwonted and abnormal rate of mortality.

The condition of Edinburgh is not a new subject with us, as our readers are aware; although many of our suggested precautions have been treated with a sort of Cassandra-like indifference, if not with actual neglect. Only about a year ago, for example, to go no further back, we pointed out several circumstances concerning the sanitary condition of the old town of Edinburgh. More particularly, we have shown, in the first place, the urgent and imperative want of a liberal supply of water; secondly, of more water-closet accommodation in the closes of the old town; we then referred to the sanitary condition of the New Town of Edinburgh as being, comparatively speaking, as much in want of sanitary improvement as the Old Town itself; and, finally, we pointed out that no attention was bestowed on the disgusting condition of the gasworks and irrigated meadows, and of their evil influence on the Palace of Holyrood; besides supporting, as best we could, the removal of the medical hospital to a new site; and the urgent need for improvement in the whole system of the drainage of the city.

It is the misfortune of all true disciples of the modern science of sanitary economy that their labours constantly bring them into dangerous collision with the novelist and the poet. The story which we have to relate, however true it may be, is always dull, prosaic, and uninteresting. There is no romance about it. On the contrary, it frequently becomes a duty to destroy, in a great measure, the preconceived and popular idea with regard to a picturesque city like Edinburgh, which most people suppose, from the circumstance of its being beautiful, should at the same time be salubrious and healthy. And the capital of Scotland is so surrounded with romantic associations, natural and artificial, that whenever we come to report on its actual condition we are, in all probability, accused of a *suppressio veri* or an *animus hostis*,—a design of either withholding our admiration, or of positively perverting the character of the place. We cannot do better than enter once more our strong disclaimer of any such intention. Although it has been, and will be, our study, to tell some disagreeable truths concerning this fair city, we have always endeavoured to do so as temperately as possible. Our business is to deal with *principles*, whether of local or central administration or of popular practice, and if we can show these to be antiquated or injurious to the cause of progress and public health, the fault is not ours if we must say unpalatable things.

Edinburgh, in fact, even with regard to its recent sanitary legislation alone, and totally irrespective of its being the capital of Scotland, is a city which no denizen of the British Empire can regard with indifference. Occupying not altogether unworthily one of the finest sites of which a modern European city can boast, Nature has also been profuse in supplying it with the best of all our building materials. There is no sandstone with which we are acquainted superior in point of quality to that of the Craigleith, Binnie, and Redhall quarries; and, putting the element of design out of the question, it may be added that when occasion serves there is not better building to be seen anywhere than in Edinburgh. It is true that the division of labour is not carried out to the same extent in this northern metropolis as it is by the English, and more particularly by the London builders. But that is neither here nor there. Those who have examined the ashlar work of the Register-office and the Edinburgh and Glasgow Bank, the rubble work of the Edinburgh prison, or even the brickwork of the India-rubber manufactory, will speedily arrive at the conclusion that in Edinburgh there is not, and never has been, a lack of high mechanical skill in her building trades.

Nor is it possible to find fault with her present race of architects and engineers. Faults have, doubtless, been committed, and grave ones, in our estimation, in the mere planning of the streets and buildings of the new town; and most of the principal streets and squares, although spacious and handsome, are tame and monotonous in their design and construction. Hospital construction, which has reached one of its highest forms of development in Edinburgh, does not result in medical hospitals; but a curiously connected series of palatial edifices, certainly ornamental to the city, the ostensible purpose of which is to give a limited quantity of accommodation to a small number of healthy boys or girls, and their teachers, regardless of expense. Accordingly the whole funds nearly are lavished on the external walls, and on heavy, florid, and cumbrous enrichments. Hence, while speaking with a certain qualified admiration for this kind of architectural work, it is to be feared that the architects have fallen into a grand and irretrievable mistake,—that is to say, of designing palaces in place of hospitals. At the same time no one will say that the Scottish architects are not capable of planning and constructing decent ordinary houses, if only the genius of their country or its climate—we do not know which—would permit them to get rid of the dangerous and unwholesome practice of planning common stairs.

These common stairs lead to much of the high death-rate of Edinburgh; and are, we can confidently assert, from repeated and painful examination, nothing more nor less in most cases than a common nuisance. They are never clean, seldom ventilated, and almost always have the water-closets, if there be any, communicating with them.

The house-drainage of Edinburgh is also sadly defective. Even in the best streets of the new town those pestilent abominations which we term "cesspools" are still commonly employed and connived at by the local authorities. Illustrations of these will be found in a previous volume. But the drains upon the whole seem to be much superior to the common sewers of the city. A report of one of the principal sewers of the southern districts lately published shows that it is in a dangerous and disgraceful condition.

As to overcrowding the population, we must turn to the Old Town; but with regard to it we shall be very brief. So much has been said and written of late about the architectural beauties and blemishes of these ancient and dingy remnants, that we may assume this subject to be well enough understood. Besides, when we find a community fully alive to the evils under which they suffer, and doing their best in the shape of levying assessments, and trying otherwise to effect what Lord Provost Chambers calls "a perfect cure," we must confess that we do not think ourselves justified in taking up minor defects, or squabbling about minute differences of principle. And really it must be said that the Edinburgh people are at length thoroughly ashamed of the Old Town and its insufferable nuisances. Indeed, they seem almost disposed to raze the old closes to their foundation rather than be longer annoyed with them. But we are afraid it is not for poor Edinburgh to proceed in this imperial and cavalier fashion. Even with Mr. Chambers's comprehensive scheme,—which will cost, it is estimated, 300,000*l.* for the mere acquisition of old property and laying out of new streets, and which will occupy upwards of thirty years to complete it,—even with this scheme carried into effect, by far the greater bulk of the densely-populated quarters of the Cannongate, the High-street, the Cowgate, the Grass-market, and the West Post, will still remain in their pristine condition, and therefore still continue to exercise their fatal influence on the statistics of poverty and crime, as well as disease and pestilence.

In order to give some idea of the condition of these tenements, we shall extract from Dr. Begg's little book on "Working Men's Houses" some statistics which bear on the question. The details of the whole of this part of the last census have not been tabulated, we are told, in regard to the principal towns and country districts of Scotland, "in consequence of the parsimony of the Government and the indifference of the people." But they are given in regard to Edinburgh and Glasgow, and are, no doubt, exceedingly important.

In Edinburgh, 121 families live in single-roomed houses, each *without a window!* It further appears that 13,209 families in Edinburgh, representing at least 50,000 of the inhabitants, live in houses of only one apartment each. But even this does not indicate the full amount of mischief; for 1,530 of these have from *six* to *fifteen* inhabitants residing in each (census, 1861). This, we must admit, at once presents a most shocking state of things; and putting aside the abstract question of supplying houses to this class of the population, which we shall not discuss at present, although it constituted part of the late Lord Provost's programme, we ask, in all humility, how such an unspeakable quantity of abomination as this

overcrowding must represent should be tolerated for a moment at Edinburgh? It is now some years since we indicated the only absolute remedy for it, which is simply that those tenements ought to be as regularly inspected as the common lodging-houses.* It is no proper answer to this reasonable request, which we have more than once heard cropping out, that we "shall invade the sanctity of the domicile." No philanthropist or humanitarian can possibly have a greater respect for domestic liberty and security than we have; but the conditions of the social contrast, so to speak, are entirely changed when this domicile is transformed into a den of thieves or a hotbed of contagious fever; we therefore earnestly and sincerely recommend the Edinburgh authorities to give some attention to the necessity of inspecting these over-crowded tenements.

As to the method of surface cleaning out the closes, to which we have often referred, there can be no doubt whatever that it stands in great need of reformation. It is quite true, we believe, that considerable pains are taken by the scavengers to remove the surface ordure every day. And if the theory that the poor inhabitants who are supposed to carry their pails down the interminable stairs to the police-carts at certain hours were actually borne out by the facts, then it might be admitted that the system of cleaning these closes is, practically as well as theoretically, what its supporters claim for it, the best system, not only for Edinburgh, but for other large towns of the kingdom.† But the difference between the beautiful city of Eden on paper, as Charles Dickens describes it, and the beautiful city of Eden in fact, is not greater than that which exists between the theory of the local authorities and the practice of the poor inhabitants! Not our experience alone, but the united testimony of every Englishman who has ever looked into these dark, dingy, and pestiferous alleys, goes to prove that not so much during the day perhaps, but almost invariably during the night, they are literally converted into the purposes of open sewers! The smell, after a certain hour, is literally the worst thing in its way we have had the fortitude to encounter. The fact is there is no use in setting down certain difficult or impossible conditions, and expecting us to believe they are complied with. Acts of Parliament are of little use; Police Bills, as Tom Hood said, are *purgatory*; and even punishment ceases to have its terrors. In the first place, to carry down a pail of putrid filth ten or twelve stories might be, and is, we believe, generally done by the poor women. But to proceed still further with their ghastly burthen, up a close 300 ft. in length, with a gradient of 1 in 5, in order to wait there for the police-cart, is a thing which they will not do, and which almost nobody expects them to do! Secondly; this surface-filth, of which there may be several thousand square yards collected every morning by the scavengers with wheel-barrows, constitutes a most valuable element of the city revenue, under the head of farm-yard manure; and although we have not been able to ascertain that such is the case, we have no doubt that it is sold separately and at a higher price than the other heterogeneous ingredients of which that commodity is composed. If so, of course the authorities would be interested in obtaining it *pure et simple*, and hence they might be supposed to connive even at a systematic infraction of their own ordinances. As we have said, we do not know such to be the fact; all we can say is that the results look uncommonly like it. In the third place, as we have previously pointed out, the water-supply to these closes is so scanty and insufficient as to make it a disgrace to the city; and this fact of itself is sufficient to account almost for the correlative parts of the phenomenon.

Indeed, we never mention the Edinburgh Water Company without experiencing a certain degree of regret, as well as a disposition to find fault. There can be no doubt that it is well managed, that its interests are carefully protected, and that it had all the legal right to sell its water to the best advantage which repeated Acts of Parliament could confer. But as a joint-stock company of private traders, looking more to their own interest than to that of the community, and particularly the poorer classes of the community, we could not do otherwise than support the principle which ultimately led Parliament to hand over its property and vested rights to the town council. Let us hope the change may be for the better. Let us hope the municipal government of Edinburgh, under the guidance of Lord Provost Law and his able legal advisers, may rise to the occasion of this warning death-rate. It has been jocularly said that Edinburgh is this moment "under the reign of Law;" let us hope the expression may not undergo a change to "the reign of Terror."

* *Vide* Report of the Social Science Association, 1861. Compare further "Another Blow for Life." London. 4to. 1864. The *Scotsman*, it would appear, adopted our views to a limited extent only. See that paper, March 9th, 1866.

† The system of cleansing pursued in Edinburgh (which I am prepared to prove is not only the best adapted for Edinburgh, but for other large towns) consists in the removal of all refuse and filth, which, if not passed into water-closets, *is ordered to be laid upon the streets*."—Dr. Littlejohn's Sanitary Report, p. 108.

THE EXCHANGE BUILDINGS, LIVERPOOL.

THIS large and important pile is now as nearly as possible completed externally, so that an idea of its general success as an architectural design can be formed. Occupying three sides of a large quadrangle, the fourth side of which is nearly filled up by Wood's pleasing and artistic composition, the Town-hall, and in the centre of which is Nelson's monument, an unusually good specimen of composition, motive, and outline in this class of work, it may be said that few large buildings have been recently erected under more advantageous circumstances for the attainment of a striking and dignified architectural effect, so far, at least, as site is concerned. The requirements of the building, however, have in some measure stood in the way of the architect. The best point about the old quadrangle,—viz., the heavy rusticated open arcade, with its massive piers and deep shadows between, which formed the ground story of the building architecturally, —is replaced in the new building by an arcaded covered way running around the quadrangle, but standing out from the line of the main building, to which it forms, in fact, only a continuous portico, with a glass roof, to admit light to the office windows, opening upon it. This was almost necessary, in order to obtain a sufficiency of light; but it certainly has not the fine effect which a real arcaded ground story would have had; although the new arcade, with its rusticated piers, flanked by sub-shafts of granite, is very picturesque and piquant in design. A little colour in the glass roof might have been introduced with very good effect, and would also have given a little more shadow within the arcade.

The general style partakes most of French Renaissance, with a very château-like air and outline about it. In the centre of the west side of the quadrangle is the entrance to the great news-room, through a vestibule with a tiled ceiling very rich in colour. The news-room is, taken altogether, a very fine room;* a large square area, with galleries on two opposite sides, and lighted from a large glass dome in the centre, which, however, rises in rather an unsatisfactory manner directly out of a flat ceiling. Were the dome not entirely glass and iron the effect would be very bad; as it is, it is less objectionable in appearance. The ceiling springs from the wall in a cove of considerable radius, intercepted by real or apparent vaulting-ribs springing from the pilasters which divide the wall-space into compartments, thus leaving the cove, in fact, a series of pendentives, the tympana between which are filled in with alto-relief Scriptural designs of considerable interest; the only drawback being that owing to the position of these designs with regard to the cove overhanging them, the upper half of the figures is in perpetual shadow, the light from the dome not reaching them directly. In the centre of the north side of the quadrangle the composition is emphasised by a projection to the line of the arcade and a loftier roof, and under this centre is a broad passage right through to the street outside, the height of the ground story, the floors above being carried on stone columns which had the same purpose and position in the old building, save that they then stood on the ground level and carried a vaulted ceiling, whereas they are now elevated on pedestals and carry a flat ceiling divided in panels by soffits crossing at right angles, and meeting rather awkwardly upon the broad flat abacus at the head of the columns. The elevation of the columns on pedestals is an improvement, but we should have much preferred to see shorter new columns (or the old ones shortened), and a vaulted ceiling as before; more might certainly have been made of this passage-way if so treated. The internal arcade on the north side is continued under the east block of building to form another exit into Exchange-street East, through an archway with a heavy archivolt springing from brackets and trusses. At the north-east external angle of the building a feature has been added not contemplated in the original design: the angle is a rounded one, and above the roof-line rises a small circular tower of the same radius on plan as the sub-structure, and capped with a picturesque, somewhat Chinese-looking, conical or bulbous roof. A feature here was wanted, but it is a pity this was not foreseen, as, of course, the present tower is a kind of sham, having no basement of masonry except on the external side which comes down to the ground; and this is so palpably the case, that the design above the roof should, at any rate, have been as light as possible, both in reality and appearance; whereas, in fact, it is almost solid wall all around, only broken by four small windows alternating with four pilasters of very slight projection. These slightly-projecting pilasters are a feature in the building, and proper, indeed, to the style, but such a very slight projection is detrimental to the effect of dignity and solidity. The predominance of rusticated pilasters in the lower portion of the building, too, does not please every one; but as to this feature in architecture tastes differ. There is some sculpture on the internal façade, by Mr. Woodington, of London, worth notice. Over the centre of the north side is a large tympanum, filled with a design representing Philosophy sending out Commerce and Science (we believe), to enlighten the minds and ameliorate the condition of the less advanced nations of the world, who are shown springing forward to receive these emissaries; a composition which is not only notable for a considerable breadth and dignified simplicity of treatment, but also has the merit (rare in sculpture of this kind) of really telling its tale, and expressing its general motive clearly and intelligibly; though it was hinted to us that Philosophy was not very much known on the Liverpool "flags," which may be the reason she has been "skied" at the top of the building. In a smaller tympanum, on the west side of the quadrangle, are figures said to represent the four quarters of the globe, and we see no reason why they should not: the Yankee and African types are, at all events, apparent. A similar tympanum on the opposite side shows Raleigh, Drake, and Cook consulting together for the good of their country,—an anachronism which was scarcely necessary. Was there no other Elizabethan worthy who might have made a third with Raleigh and Drake? Let Mr. Kingsley or Mr. Froude answer for us. There are also six statues at the first-floor level in the quadrangle,—two, those of Galileo and Mercator, over the central passage on the north side, two very dignified figures; the other four standing out, on the east and west sides, upon the front wall-line of the arcade; on the west, Drake and Columbus; on the east, Raleigh and Cook, the keen, eager face of the latter making a capital subject for the sculptor, which he has well availed himself of, and the treatment of the costume being very successful as a combination of realistic with artistic effect. We regret we cannot say so much in praise of the sculptured ornament on the building; not that there is any fault to find with the execution, which is clear and sharp enough, but that much of it is of a type somewhat commonplace, and which we had hoped we were getting rid of, as wreaths and festoons, in "the old Roman way."

With regard to internal plan, the staircases are very light, airy, and commodious, and there are some very good offices in the building; but, from what has been said to us by commercial men on the spot, we should fear that the architect has made his rooms a little too deep in proportion to the size of the windows, in many cases, for them to prove convenient working-rooms for a large staff. But really the problem how to make an architecturally successful building, and yet give the amount of light which cotton salesmen seem to expect, is a task almost beyond the ingenuity of any architect. Taking the building as a whole, it is an interesting piece of architecture. There are, as we have said, some rather commonplace details in it, but nothing that could be called "vulgar" about it (and of how many modern buildings of this class can we say so much?); and it has not

* A view of this will be found in a previous volume of the *Builder*; also a view of the exterior of the building.

only a generally picturesque appearance, but there are many little "incidents" in the design which are pleasant and original—the treatment of the external archways over the entries for lowering goods into the vaults, the entrances to one or two of the staircases, particularly that out of the western arcade near Chapel-street, with a straight lintel and a granite shaft in the centre—and other bits, external and internal, which might be mentioned. The little erections projecting towards the flags from the centre of the north side, consisting of two Corinthian columns standing well out from the face of the wall, with an entablature, and then two similar columns repeated in a second order over them, form a very pretty feature in a bright sunlight; but when we find this feature culminating in nothing but two scrolls which fall back against the face of the wall, our pleasure is lessened. Had it supported a good group of statuary, this would have made all the difference. So with the large engaged columns on the external north front towards Old Hall-street, which also terminate in nothing but scrolls. Despite of points of this kind, the whole building is a pleasing and picturesque design, more remarkable, however, for a rich and pretty effect than for grandeur.

STATE AID TO SCIENCE.

IT would be difficult to imagine a more crude, ill-digested, and, we fear, mischievous step than that which was taken, no doubt in all good faith and with the best intentions, by eighteen gentlemen, each of whom writes F.R.S. after his name, on Friday in last week. Those gentlemen waited on the President and Vice-President of the Committee of Council on Education, in the capacity of a deputation from the British Association for the Advancement of Science. Their object was to ask for the appointment of a Royal Commission to inquire into the relations of the State to scientific instruction and investigation. Such an application, if properly defined by the language of those who made it, is without precedent in our country. It does not follow from that fact that it is wrong. Questions such as those of the relation of the State to any members of the community are necessarily, and often very warmly, discussed in our Legislature. Even there, however, it is felt that the more discussion is confined to practical points, and the less men endeavour to lay down theories, the better.

Not only, moreover, was the form of the application manifestly ill considered, but the undesirable spectacle was presented of a wide divergence of opinion, not only among the great body of scientific men outside, but even among the members of the deputation. "We are unable to agree upon first principles," was, in fact, the statement of the spokesman. "We want a commission to hear all that everybody has to say, and then to add its own confused and confusing utterance to the general Babel."

Earl de Grey said he understood that Professor Stokes did not express on the part of the deputation any opinion as to the two points raised,—Government aid for scientific education, and the mode in which such education should be encouraged. Neither had the professor any opinion to express as to whether it was desirable that Government should give any aid at all! or whether the matter should not be left to private impulse and support. Their lordships—with as blank faces as courtesy would allow,—finding that the spokesman of the deputation had then no story to tell, inquired if any other gentleman could explain what they did want.

To this Professor Huxley replied, on the ground that he was especially unfitted to answer the question, because his opinions differed very widely from those of his colleagues. He thought a commission would be a very useful body if it could consider and report upon opinions which, at the present, were "somewhat chaotic." For himself he dissented from any Government aid being given to scientific education, and thought that support from the State would lead to "a sort of decorated and endowed idleness." Finally, if the report can be relied on, the professor was anxious for a commission, "because it would put a stop to a great deal of discussion which was now going on, which would, he believed, if duly considered, come to an end of itself!"

Dr. Williamson expressed an opinion that there were institutions now existing which are not as useful as they might be. Professor Sylvester said that there were only thirty matriculated students in Piccadilly (a point as to which the cruel want of room for those who are actually admitted must have been well known to at least some of those present), and Professor Stokes kept up the general discord by observing that Professor Sylvester was "only expressing his individual views." In fact, each spokesman seemed to be anxious rather to divert into some other channel the support now actually given by the State to some individual object, than to agree in any constructive recommendation. Mr. Stokes had a stone for South Kensington, because in that institution "two very distinct things, science and art, were so mixed together that it was not easy to find out what share fell to the one, and what to the other." A study of the reports or a visit to the schools would enable any one to solve this difficulty.

But there is something more than a display of purposeless divergence of opinion on a great subject, among men eminent in their individual pursuits. The cause of education is perilled by such a display. Never was there a time when it so much behoved the friends of education to stand shoulder to shoulder,—to drop minor differences, and to devote every effort to enabling England to make up her lee way. We have drifted behind other nations in this respect. Even Austria—the Government reports tell us—is before us. Only the Patrimony of St. Peter, out of all Europe, is less educated than England. Commerce and manufacture are showing ugly symptoms of seeking other centres. Education in art applied to manufacture is one great means that we have to arrest this process of deterioration. In that line we are certainly doing something, if not all that is desired. We must do more. We must not grudge the seed corn necessary for our future harvests. We must sow broadcast round the land that education for which our industrial classes are beginning so hardly to call. Professors may doubt, in the solitude of their lecture-rooms, how far the aid of the State should be given to industrial education. But the artisan does not doubt,—the craftsman, whatever be his craft, does not doubt. They ask for their children not bread, but that technical training and teaching which shall enable them to win bread by of their own hands, and by competition in the market of the world.

The danger is not from behind alone, nor, indeed, in the first instance. It is from above. There may be, and no doubt is, room for very widely opposed opinions as to the policy of the extreme detail of retrenchment attempted by the present Government. But as to the fact there is no doubt at all. Here a limb, and there a limb, and then a whole trunk falls before the axe of retrenchment. It is clear that it is not safe to give any opening for this keen spirit of reduction. Large sums of money are now, in one form and in another, devoted to educational purposes, which would, if not so paid, make a material figure, by way of diminution, in the national balance-sheet. Now it is attributing to a retrenching Government, a virtue and patriotism almost more than human, to suppose that they can resist the temptation of withholding or diminishing any grant which those who ought to be most eager to advocate hint to be of questionable policy. What would be the natural reflection of a Chancellor of the Exchequer? "Shall I spend this large sum, when eighteen F.R.S.s tell me it is perhaps doing more harm than good? If the value secured by the expenditure is questionable, the value of the reduction is certain. Positive £. s. d. on the one hand, against doubtful moral results on the other. Scratch the grant."

Now, we think that any gentlemen who had come forward with the innocent, and, perhaps, not unreasonable, wish that they might direct some rill of the national irrigation into their own particular trench, would be likely to stand aghast at such a result of their pottering with the distribution. As to all that they urge in favour of non-payment, a ready and willing ear will be turned. As to all that they urge as to payment, they would be on the deaf side of the Chancellor of the Exchequer. As to that there can be no doubt. Men do not absolutely cease to be human when they become Ministers; and to take that part of counsel which suits you, and to forget that part which does not, is human nature. How will these gentlemen relish it, if, in moving the estimates, the vice-president comes forward to say that a Royal Commission on the subject of education has been suggested by certain persons of such eminence that the Government felt bound to give every attention to their views. These, however, were so absolutely discordant as to show that any such Commission (even if restricted to the limits of possibility, which the proposed Commission would have altogether exceeded), would be utterly fruitless and premature. The very bases of its action were undetermined; formed, as it must be, in order to be fair, from opposing elements, its course would only be one long struggle. Each member would cross-examine each witness in his own sense and in support of his own views, and when the long account was summed up—say, in 1878, or thereabouts—there would probably be at least half as many distinct and divergent reports as there were members of the Commission. Still, as all these gentlemen were of opinion that the relations of the State to education were entirely unsettled, and that it was only too possible that private enterprise, in the matter of tuition, was being strangled and impeded by the State aid that was given in different directions, all that the Government could see their way to do was, to suspend all further grants for educational purposes until Messrs. Stokes and Huxley, Williamson and Sylvester, and those whom they represented, could come together with some more satisfactory result than that of ventilating their individual differences of opinion in the presence of the department.

We believe no men would be more startled at such a result than those eminent persons who so unfortunately agree to differ. But we put it to them: is it not this to which their interview of last Friday directly tends, if it tend to any whither? Do they desire such an upshot?

THE WATER-COLOUR DRAWINGS AT THE DUDLEY GALLERY.

THE sixth selection from the numerous drawings that are submitted time after time to the committee of taste who arrange the recurring exhibitions at the Dudley Gallery, indicates as strongly as ever the wide radius of a certain artistic talent,—now a distinguishing mark of the period,—and that a collection of drawings of sufficient merit and interest may be made very readily, with no great help from those professors of water-colour painting whose names are always a promise of attraction, sufficient to satisfy any but the satiated.

A clever, classic representation of "Poetry" (163), is contributed by Mr. E. J. Poynter, A.R.A., whose name grows bigger every day; and this nearly half-length figure, with its handsome head and dark, dreamy eyes, will help to show how well fitted he is to deal with exalted themes. That in his practice he may adopt any medium, from miniature-stipple to mosaic, may be seen in smaller works here and a larger one elsewhere, that proclaims him by "St. George"—a risen artist.

An illustration from German fairy-lore, by Mr. H. S. Marks, "The Princess and the Pelicans,"—her transformed brothers,—(169), whom, to while away the pains of enchantment, she is amusing by reading the romaunt of Sir Bruno. The pelicans are the very pink of pelicans, and their kind sister, "Pimpinella," a more real-looking princess than one might expect to find in a castle in the air; but then the terrace, with its fountain and the old German buildings, add probability to the story, and make it of more dreadful significance; for who is there who, "would he were a bird," would choose to be a pelican? A decorative design for the Prince's Theatre, Manchester, emblematical of Shakspeare (543), is a very able adaptation to the purpose, very well composed, so as to introduce many of the leading characters in the plays, and tinted with due regard to lightness and clearness. Mr. G. D. Leslie, A.R.A., lends more than his name, for he has a very broad and agreeable drawing. The pretty little girl in a punt suggests the point of sight from which he got the glimpse of "Bray Vicarage" (231), with an opportunity of painting still water and a sward-bank. More delicate, if less powerful, workmanship has been employed on a charming fancy portrait of a "Grandmamma" of years ago, years before she could have been of such relationship, for—

> "This relative of mine,
> Was she seventy and nine
> When she died?" (112)

is sweet seventeen at most, leaving it very difficult for her to frame an answer to the inquiry. She is very pleasant to regard now in her blue Joseph and spotless cambric neckerchief, though she may have been the very opposite of Mr. J. B. Burgess's devout nun in "The Convent Garden"

(255), of which he has made so forcible a picture. (187) "Study of a Head;" that of an old priest expressive of benediction, by Mr. A. Legros, is singular for the strict simplicity of its treatment—its style, that seems to eschew all style. Mr. S. Solomon is seen to best advantage in a small highly-finished rendering of Biblical text, "The Three Holy Children in the Fiery Furnace" (45), which is devoid of any attempt to poetize: the heads of the angel and the mortals immortalized are of the accepted type, and there is no exaggeration when exaggeration might have been expected,—indeed, there is need to refer to the catalogue to ascertain what the subject is,—but there is considerable power and completeness of execution to give value to the drawing. "A Young Rabbi carrying the Scrolls of the Law" (51) is very admirable for its rich colouring. But to what country, to what period, do the youths and maidens belong who are walking in procession, "In the Summer Twilight?" (121), whence do they come, and where are they going? In this, and even to a greater degree in his "Pair of Lovers" (324), Mr. Solomon shows a commingled appreciation of the old master, R. Westall, and the younger originator,—whoever he might have been,—who instituted a peculiar sect of post-painters! There are instances here, in this gallery, to denote that even a narcoticized dreaminess might be offered as poetry,—and the narcotic has been toleration, and even praise sometimes; but it is far easier, always, to emulate the eccentricities of excellence than the excellence itself.

It is gratifying to find so many ladies affording assistance to the success of this association for the spread of fine-art taste.

"After the Ball" (in French, with a verse from Théophile Gautier to illustrate,) has suggested to Miss or Mrs. (why not made clear in catalogue?) Lucy Madox Brown a fair chance, it would seem, to make a clever picture. A *belle* who is fond of dancing (Terpsichore only knows how many arms may have encircled her waist; but her muslin frock is very rumpled) on her return home, has fallen asleep before her attendant can assist to disrobe her, and with swimming head is waltzing again whilst day is breaking to tell her that she was happier yesternight (12). With deep tones and good effect the lady artist has told all the circumstance, and it is to be hoped that the bright sunlit to-day may bring more invitations to the lady who dances and the lady who paints—not her own face, but others; and some as bright, even though as humble, as "Yeonne's" (36), by Miss F. M. Alldridge, to whom the sea-breeze has been the only "*cosmetique*." But other winds blow fresh complexions, too. Look at Miss Constance Phillott's "Shepherd Swain" (172),

"Piping down the valleys wild;"

although he doesn't happen to be piping, but only preparing to pipe. Miss Kate Greenaway places a young lady near the tree of mischief, and calls her "Apple Blossom; a Spring Idyll" (183),—a pretty drawing, notwithstanding its green shadows, and though it shows no such command over the *porte crayon* and brush as the idealised life-size study by Miss Marie Spartali, (369), "The Romaunt of the Rose."

Miss Adelaide Claxton relates, with strong light and dark effect, "The Old Housekeeper's Story" (385), anent the doings of an Elizabethan ancestor, so interesting and horrifying to the younger of the sister listeners that she fancies the ghost of the defunct cavalier to be close behind her: and so he is,—one of Miss Claxton's best ghosts. Miss Florence Claxton depicts a timid little French Governess nervously awaiting an interview for engagement (447); and Miss O. P. Gilbert, a young lady too far advanced to need any such instruction as one of her own age could impart—she is twisting the globe, and going through a light course of "Astrology" that will not cost her a headache (417).

With some choice specimens of flower-painting, signed Ellen Coleman, Caroline Eastlake, and others, there is many another clever emanation from lady-artists among the most important items of the collection; for instance, "Lady Betty" (209), by Mrs. Charrotie, so bright and winsome, and Miss Topham's "Portrait" of a flaxen-haired child, is as light and lively as those who think her most lovely would wish her to be. Miss Juliana Russell depicts "A Lover's Quarrel" (279), and so well, as to make it interesting to more than a third party; but only so far as clever narrative can account for, as

"Sudden storms are short,"

the method of relating the incident is of far more consequence than the matter it treats of. The drapery on the female figure here is especially well done.

"The Pilgrims of the Night" (25) are not to be so easily understood as Mr. A. B. Donaldson's capital studies from positive facts; see (110) "Nuremberg Walls, with the Church of St. Lawrence," with more from the same locality, sketched with vigorous ease, if not with the elegance and extra manipulative care that Mr. C. Earles's similar subjects, "The Citadel of Nuremberg" (63), and "The Old Hospital, Nuremberg" (305), show on his part. Mr. T. R. Macquoid always draws conscientiously and unpretentiously, as the several specimens of his skill to be found here will testify, none better than (32) "Cloisters—Padua."

A run through the catalogue recalls numerous works that would serve as proof of an aggregate degree of excellence obtaining throughout the exhibition, with variety to assist in its interest.

Child-life is pleasantly illustrated by Mr. R. T. Waite, whose pinky-faced peasant boys and girls are hanging "The May Garland" (26) at a neighbour's doorway; by Mr. W. Wise, who depicts a little girl when "Shy" (43) naturally and unaffectedly; Mr. Briton Riviere, a kind, motherly little body, who is feeding lambs, "Orphans" (156); Mr. J. Hayllar, one who would be naughty if she could, for she has been plucking strawberries—forbidden fruit, as the strangled blackbird at her feet clearly makes known—and would eat them too if she were not deterred by "The Awakened Conscience" (425); and by Mr. R. W. Macbeth, who records child aptitude to see fun in everything, by means of his funny little French provincials, who are all agog with curiosity and excitement to know more about "Des Étrangers," who, fashionably-attired, have come to the village church to say their prayers with humbler equals. A very successful drawing this, and an agreeable one to see often.

Landscapes; sea-pieces; rocks, mountains, and hills, are no mean features in this general exhibition of water-colour drawings.

Mr. Soper's view of "Godalming" (16); Mr. J. L. Roget's bit on the "Coast of Guernsey,—Le Portalet" (17); Mr. H. Macallum's (57) "Morning Breeze"; Mr. C. J. Lewis's (6) "Sheep Washing, Kent"; Mr. G. A. Scappa's "Richmond Castle, Yorkshire" (90), with (113) "Near Tamerton Foliot, Devon," by Mr. E. M. Wimperis; "The Bracken Boat" (128), by Mr. Macallum again; "Haymaking,—Seatollar" (164), by Mr. C. R. Aston; Mr. Arthur Severn's panoramic view, "From the Shot Tower at Waterloo Bridge" (168); "The Old Town of Moret (Seine et Marne), France," by Mr. G. Mawley (184); "The Lamb's Hill, from Llyn Gwynant" (185), by Mr. T. Danby, a very beautiful work; "Near Hastings" (261), by Mr. H. Moore; "Cookham Loch, Berkshire" (299), by Mr. J. Parker; "Pendennis Castle,—Ebb-tide: Evening" (333), by Mr. C. P. Knight; "Evenings on the Tiber, Rome" (461), by Mr. M. Brennan; "Houses of Parliament" and the "Victoria Tower and Westminster Bridge" (479 and 492), by Mr. W. R. Beverley; "The Babal el Nase, or Gate of Victory, Cairo" (494), with Mr. A. Goodwin's clever hazy landscape "Arundel" (528), are things we saw and noted. Mr. J. Richardson's "Cattle passing the Blackmount on their Way to the Lowlands" (82), and Mr. H. Hardy's admirable illustration of "The Fox and the Sick Lion" (452), lead in their special department.

HOUSE ON RICHMOND HILL.

A COMMODIOUS dwelling-house, of plain Elizabethan type, has been erected on Richmond Hill, under the direction of Mr. F. H. Groves, architect. It was commenced by the order of the late Lord Justice Selwyn, who unfortunately died before it was completed, and it may be mentioned in connexion with the residence at Chertsey, illustrated in our present number, inasmuch as it exhibits in parts of the construction, the use of concrete. The basement includes housekeeper's room, butler's pantry, servants' hall, kitchen, scullery, and store-rooms.

The ground-floor consists of drawing and dining rooms, library, and business-room (the two latter are accessible from the inner lobby, without entering the body of the house), principal and back stairs, and the first and second floors provide bed and dressing rooms.

As to the construction, the whole of the basement, excepting the housekeeper's room, is arched over with Portland cement concrete. One ceiling is panelled.

The whole of the back stairs and offices adjoining, within the outer walls, from the basement to the roof, inclusive, are formed in the same material, viz., Portland cement concrete, and are extended so as to separate the eastern half of the house from the western half; and again, the latter (western half) is divided into two portions, the south-west angle rooms being separated by the principal stairs, which, to the height of the second floor, are formed of the same material, from the north-west angle rooms, and by walls on the second floor to the roof.

The ceiling of the principal stairs is arched with a fangroin ribbed ceiling, as are the ceilings of the inner lobby and stair landings.

It is held, and with some reason, that the house is largely fireproof.

"THE PAINTERS' DESIDERATUM."

THERE are many occasions when it is desirable that one coat of paint should follow over another much more rapidly than the mediums at present in use permit, and very few occasions when the avoidance of the smell that now attends the operation of painting is not desirable. To meet these *desiderata* a medium under the title at the head of this notice has been recently patented, and is now obtainable. It is intended for mixing with white lead and other pigments to form paint, in lieu of linseed oil, boiled oil, turpentine, and dryers; and the patentee claims for it that it is perfectly inodorous; that in less than half an hour after application it is sufficiently dry and hard to receive another coat; that it does not blister on exposure to heat; that it is more durable than ordinary paint, cleans readily, and is not injuriously affected by soap or alkalies. He says further:—

"It is economical in use. In consequence of the 'body' contained in the composition three coats of paint mixed with it are equal to four of ordinary paint; and upon the principle that 'time is money' the great saving in the time always lost by workmen in waiting until such paint is dry, or going from one job to another, is more than sufficient compensation for the greater original cost. For example, a street-door which requires the attendance of a workman on five several days to complete the painting and varnishing, can, by the use of this composition, be painted with four coats and varnished in one day. It is particularly applicable to iron railings and work exposed to the contact of passers-by, rendering unnecessary the caution of 'Wet Paint.' In consequence of its quick-drying properties it is not subject to injury by dust or rain, as is the case with ordinary paint."

We have seen for ourselves that the material works very pleasantly, and affords sufficient time in drying for the painting to be properly done. As to its durability we are unable to speak, but we may safely say that if the advantages claimed for it can be maintained, "the Painters' Desideratum" certainly deserves attention.

THE PARIS OPERA HOUSE.

REMEMBERING all the years passed and all the millions spent, most of our readers will be surprised to learn that the exterior alone of the new Opera House is approaching completion. The interior is a perfect void: a few iron columns alone mark the position of the boxes and lobbies that are to be. We should think it will be a year before the interior is completed. We obtained admission with some difficulty, as a special favour, and learnt that any Frenchman applying would be refused point blank. Apparently the powers that be wish to keep the public in ignorance of the fact that the gorgeous façade of the Opera House is a mere empty shell.

ON THE ORNAMENTAL FEATURES OF ARABIC ARCHITECTURE IN EGYPT AND SYRIA.*

I PROPOSE to call your attention more especially to the various *ornamental features* of the Arabic architecture of *Egypt and Syria*. But in order to do this explicitly, it will be necessary for me to touch to some extent also on some peculiarities of construction; and to point out some of the special features and stepping-stones of its development and growth.

It may be broadly stated that Arab architec-

* From a paper by Mr. John D. Crace, read at the ordinary general meeting of the Institute of British Architects, on Monday, the 31st ult.

ture commenced *as a distinct style* about the middle of the ninth century, a little more than 250 years after Mahommed's "flight," or about seventy years after the famous Haroun es' Rasheed of the "Arabian Nights."

The earliest Arab monuments in Egypt upon any records of which reliance can be placed are the "*Nilometer*," first completed A.D. 861, but altered and added to A.D. 872 by "Ibn Tooloon;" and the *Tooloon Mosque*, built A.D. 876. As is well known to most of you, both these buildings possess pointed arches, which are often quoted as the earliest known examples in systematic use. In addition to this, however, both present many features which continued throughout the best periods of the style. It may be as well here to note that the *Tooloon Mosque* is entirely built of burnt brick "*stuccoed*" to resemble stone; the *ornament*, which is of a bold and artistic character, being *cut* in the stucco by hand—not cast. In both this and the Nilometer the inscriptions are in the "*Kufic*" character, which bears the same relation to modern Arabic writing that our old black-letter does to our modern type.*

From the foundation of the Tooloon Mosque about a century elapses before we arrive at another distinct landmark in Arab architecture. This is the Mosque of "El Hákim" (the founder of the Druzes). This mosque was founded A.D. 1003, and has much of the same character as that last mentioned, but is richer in detail. The writing here is also Kufic and, intermixed with excellent scroll ornament, forms an admirable frieze. The open parapets here, of simple geometric pattern, are worth attention.

The examples which I have so far quoted, whilst possessing a distinct Arabic character, show almost as wide a difference from the subsequent Arabic monuments as our own "Norman" work does from the English work of the succeeding century. A certain massive, heavy appearance distinguishes them; nor was there as yet, apparently any extensive use of the variegated materials which become so conspicuous a feature in the exterior of most of the later buildings.

I may here notice one very interesting monument of Cairo. Close to the "Morostan," and opening to the Kalaoon Mosque—in one of the most picturesque streets of Cairo—a very beautiful pointed doorway arrests the attention. Most people are struck with it; but the architect most so, for he at once recognises the familiar mouldings and grouped shafts of the Early Pointed architecture of Northern Europe. Its history is curious and very interesting. In A.D. 1291 Akka was taken by the Sultan Khaleel, the son of El Munsoor Kalaoon, the founder of the Morostan. Gibbon says of Akka (which was, for some years previous to the siege, the metropolis of the Latin Christians):—"It was adorned with strong and stately buildings, aqueducts," &c.; and that, after its capture, "By the command of the Sultan (Khaleel), the churches and fortifications of the Latin cities were demolished." He there found this beautiful doorway, the work of crusaders, and removed it to Cairo, where it adorns the mosque which bears his father's name. The Arab historian "El Makreezee" speaks enthusiastically of its beauty. I mention this doorway because it is *earlier* than any of the more elaborate Arabic buildings of Cairo, and evidently excited considerable admiration in the Arab mind. An Arabic inscription on the lintel gives the date of its erection as 698 A.H. (or A.D. 1299). The Kalaoon Mosque was founded A.D. 1286, and completed A.D. 1305. The Mosque of Sultan Hassan dates from about A.D. 1354, and is probably the most important of the mosques of Cairo. In it we find the details of Arabic ornament wrought to their greatest perfection. It would be impossible to find, for instance, a more exquisite specimen of writing, treated ornamentally, than the frieze of the great court and alcoves. The scroll interwoven with the Kufic writing is admirable. One door in this mosque is plated, as usual, with bronze in geometric patterns, but has raised bosses, exquisitely inlaid with the most delicate niello ornament in silver.

The noble recess of the main entrance of the Mosque of Sultan Hassan is a well-known feature; and its details of inlaid coloured stones, sculptured and interlaced patterns, are among the most perfect examples of Arabian art. The style has here attained its full development; combining the most perfect and highly-finished details with the noble severity of the lofty walls, upwards of 100 ft. high.

We have now arrived at the middle of the fourteenth century (the period of Yussuf's Alhambra). We may turn to the beautiful group of domes and mosques known as the "Tombs of the Caliphs," about two miles out of the city of Cairo. We there find the grand sepulchral *Mosque of "Barkook,"* a most worthy example for study. This dates from the close of the fourteenth century ("Barkook e Zahir," died A.D. 1399). For breadth of mass and effect, good proportion, picturesque parts, and judicious detail there are few better examples. Here (as in most of the same group of buildings) we find the use of striped courses of dark and white stone.

The mosque of "*El Moäiud*" in the city, with its spacious open cloister and well-proportioned arcades, follows a few years later, about A.D. 1415; and in its ceilings and cornices we find an elaborate specimen of coloured decoration; the colouring being nearly confined to black, white and gold, with a relief of blue and red. Its masonry, both interior and exterior, is of red and white courses; the columns (being, as in very many of the Cairo mosques, borrowed from more ancient buildings) are of red porphyry.*

Then, at the close of the fifteenth century, we have the Mosque of "El Kaitbai," who was buried here A.D. 1496 (when the Moors had already been driven from Granada). This is another of the groups known as the "Tombs of the Caliphs," and at once the most perfect and the most picturesque. It would probably be difficult to find in any country, or in any style, a more charming group of building than this mosque, with its high, graceful minaret, and its delicately-sculptured dome, standing out from the pale desert against the rocky distance. The minaret may, I think, be considered the *most* elegant of all the Cairo minarets. The detail and interior decoration of the building are worthy of its general aspect. I shall presently refer to them again. With a view to making more clear the relative ages of the buildings I have mentioned, I have prepared a table showing their dates, side by side with those of the Alhambra.

My object in enumerating the buildings I have quoted is to afford the opportunity of tracing the development of Arabic architecture by means of distinct and important landmarks. The list might be largely increased, and the intervals shortened, but without any very useful result.

It is now my purpose to consider the various details of Arabic buildings, without reference to date except where special notice is called for. It is, however, first desirable that I should set before you a few of the leading types of the structures themselves. They may be classed as follows: "Mosques," "Sebeels," "Gates," "Khans," and "Dwellings."

The mosques vary much in plan, according to the special conditions of their situation. The original form is an open court, surrounded by a covered, arched cloister of one or more aisles; the number of aisles being usually larger on one side than on the others, as two, three, or even five under the widest covered part in the "Mehràb," or sacred recess, towards Mecca, and the high pulpit ("mimbar"). The decoration is also usually richer in this part. A fountain, or large covered cistern of water for ablution, usually occupies the centre of the open inclosure. This type is taken from the first mosque at Mecca, and examples of it are found in the grand mosques of Damascus and Hebron; and at Cairo, in the mosques of "Amr," "Tooloon," "El Hakim," "El Moäid." But some of these, as notably that of Damascus, have the sanctuary altogether enclosed. The second type has an open court, having a centre fountain, with one or more large arched recesses or alcoves opening to it. Such is the Mosque of Sultan Hassan. Under the third head may be classed the mosques which are either altogether enclosed and roofed over (of every variety of plan) or are only partially open to the air. A fourth group may include the Kubbets, or square-domed structures, which exist in considerable number near Cairo, and have been, in fact, mausolea. Some of these are beautifully and richly ornamented.

The "Sebeels," or drinking-fountains, are very numerous in Cairo, and are among the most striking of its buildings. They are, most frequently, at the corners of streets, or in prominent places. Below is a single closed chamber, lighted by one or more large metal grilles, sometimes simple, sometimes very ornamental. Within is the water supply, with which a tube communicates, and, terminating in a small brass pipe or nozzle, allows the wayfarer to quench his thirst *by suction*, for the water is rarely allowed to run to waste.

The upper story of these buildings is almost always a school. They have usually been built as an act of charity by some person whose name they afterwards bear. "And thus," say the Arabs, "the thirsty man remembers gratefully the name of the founder; as also does the youth who is trained (and caned) in his school."

The residences, or private houses of Cairo, are of every variety of general plan; most, but not all, of the better class having an open court, into which the reception-rooms open. The other rooms are built with a special regard to privacy. The rooms of the harem are generally on the first floor, and some of these are very handsome. I shall perhaps best explain myself by describing to you one or two of those Cairo houses (built when Arabian art still flourished) which I have visited.

I will take first that of Ibn e' Sadád, the head of one of the oldest Arab families of Cairo, and a rich man. The visitor enters by a double gateway from the street into a large open court. Upon his immediate right a considerable space is screened off by ornamental trellis-work. This is a private mosque, used for the devotions of our host and his household. There are chambers over this. On the left, an upper chamber, having a large window (a very exquisite specimen of the "Mushrebeeyeh"), is supported at its outer angle by a single column. The remainder of the court is surrounded by buildings with screened windows, but a deep, open recess, with divans and cushions, occupies the angle furthest from tht entrance; a passage near this leads to the garden behind. The grand reception-rooms occupy nearly the whole of one side, the rooms being the full height of the building. These rooms I shall endeavour to describe. In plan they are three; but, except by a step in the floor, and the arrangement of the ceilings, they practically form one large saloon, called *Mandarah*.

Entering a small doorway from the court, the first room is lighted from above by an octagon lantern or opening in the centre of a ceiling of wood elegantly panelled by mouldings into

* The modern Arabic character was not used at all till the middle of the tenth century. Even then the "Kufic" only was used on buildings till the end of the "Faternite" dynasty, about A.D. 1170. After that the Arabic and Kufic were *both* employed. Even as late as our fifteenth century, single inscriptions are occasionally written in both characters side by side.

* I have observed not only Roman but *ancient Egyptian* capitals in use as both capitals *and bases* of columns in mosques.

The Dates of the Arabic Buildings of Cairo, compared with the Alhambra.

Date.	Cairo.	Alhambra.
A.D.		
876	Mosque of Ibn Tooloon.	
1003	Mosque of El Hakim.	
1272	... ...	Death of Ibnu-l'Ahmar at Kasr-l'Hamra. The first Moorish King who resided there.
(1291	The Gothic portal removed from Akka—re-erected 1299).	
1286 to 1305	"Morostan," and the "Mosque of Kalaoon."	
1302	... ...	Death of Mahommed II., who had continued the building.
1310	... ...	Mahommed III. erected the "Meejid-al-jami," described as having "Mosaics and delicate tracery."
1333 to 1353	... ...	Yussuf built and decorated the Courts of "the Fishpond" and "Ambassadors," the "Hall of the two Sisters," the Bânos, and the "Madrisah." (A.D. 1319).
1354	"Mosque of Sultan Hassan."	
1396	"Mosque of Sultan Barkook."	
1420	"Mosque of El Moäiud."	
1492	... ...	"Boabdil" surrendered Granada.
1496	"Mosque of Kaitbai."	

geometrical devices, and having pendants at intervals. This ceiling is higher than those adjoining. From the ceiling downwards the walls of this, as also of the other apartments, are lined with old *Persian glazed tiles*—blue and green on a white ground*—to within perhaps 9 ft. or 10 ft. of the floor, the total height being possibly 25 ft. or 30 ft. The lower part of the wall is plain. At the end facing the other apartment is a niche or recess in the wall, with a small cascade, having shallow steps of marble. This first room is, in fact, an ante-room, or the "durkàah" to the other, called the "leewan," which is entered by a low step, at which the domestics invariably take off their shoes, even when serving.

In the opening a transverse beam, with deep trusses, or brackets, which terminate in corbels of gilt honeycomb work, carries the roof.

In another room large parallel beams or girders, about 12 in. thick, and perhaps 18 in. apart, are carried from side to side. These are elaborately chamfered from the ends, the centre length being rounded or octagonal on the lower face. The whole of this surface is decorated with ornament in gold, with grounds of blue or other colour, each beam differing from the next; the chamfering of the ends is also gilt and ornamented. The space between the beams are divided into small square and oblong panels, the framing of which, as well as the panels themselves, is elaborately decorated and gilt. The whole effect is rich and harmonious to the last degree.

In dining with the master of the house, I observed that whilst we dined in the centre saloon, the household servants (*as well as stray objects of charity*) took their meal in the first ante-room, within our view. We afterwards retired to the further bay for the post-prandial chibouque.

The house adjoining the one just described is at present occupied by Haleel Pasha, who kindly allowed me to see a splendid room on the first floor, the "Kàah," a part of the harem. This, in addition to having very beautiful ornamental coloured ceilings, was lined to a height of 10 ft. or 12 ft. by marble, arranged in upright panels, divided by inlaid margins of elaborate design; the whole being surmounted by a broad inlaid frieze, broken at intervals by circles of coloured marbles, somewhat like that at St. John Lateran, at Rome. On one side a cascade fountain is received in the marble wall, and the water from this flows through a narrow channel into a small circular basin in the floor, curiously carved with entwined serpents. From this it is again carried to the basin of a fountain in the centre of the floor, the floor itself being paved with inlaid marble.

* The next house at Cairo which I shall describe is in a very neglected and ruinous state. It is known as the house of the Chief Mufti, or head magistrate, and seems to have been intended for reception only. It is a very interesting specimen of Arab domestic architecture. In general plan this resembles the reception-rooms or "Mandàrah" already described, the ceilings being of the same description. They are, however, very much smaller. Below the ceiling beams is a wide cove, which is painted in panels, with conventional groups of flowers on grounds alternately blue and reddish-brown. Below this the wall surface, for a height of 2 ft. or 3 ft., is painted with rough landscapes of most elementary treatment, and probably of later date than the rest, under which there is a very elegant frieze of ornament incised in white marble, and filled in with black and red cement. The wall below this level is much cut up with doors, windows, and wooden cupboards, all of varied design; but the intervals between them are lined with blue and white Persian tiles. The cascades again occur here, and are richly ornamented with gilding and inlaid pearl. The upper windows are filled with beautiful stained glass, in the Persian manner; that is, in a setting of a deeply-cut plaster or cement. The floor, with its centre-shaped fountain basin ("faskeeyeh"), is an admirable specimen of inlaid marble.

* * * *

Let us now turn our attention to the interior of the buildings, and observe the decorative treatment adopted. In the first place, it must be remembered that the same use of alternately coloured courses which we notice in the exterior is very frequently extended to the interior; and, even where they are not built in coloured material, the imitation is carried out in red and white, or black and white colours. This may be seen not only in the mosques and other large buildings of Egypt, but in the courts and rooms of the private houses, both of Cairo and Damascus. At the latter place there is scarcely a court of any large house but presents an example of this system, more or less consistently carried out; whilst the great "Khan of Assad Pascha," in the same city, although a modern and scarcely "Arab" structure, is a good example of the principle carried out to its fullest extent. ‖(*Date* 1472 A.D.) The interior of the cupola is not frequently decorated upon this system. At the base is a frieze consisting of inscription, either carved or painted, on a dark ground. Over this the upright circular wall (the drum), which supports the dome itself, is pierced with pointed windows at short intervals. These are sometimes filled with pierced tracery, or have formerly contained coloured glass, which, however, few now retain. The intervals between the lights are sometimes plain, sometimes banded,—in other cases are panelled and ornamented in colour or relief to agree with the windows. The cupola itself is often partially banded in white, black, and red, relieved by zigzag courses; and towards the top has a radiating counterchanged ornament of the same kind as that already described. This is one treatment, and specimens of it are to be seen in the "Tombs of the Caliphs," notably in that of "Barkook."

Occasionally, however, the cupola is far more richly decorated. That of the "Kubbet el Fedaweeyeh" has a bold and elaborate Moresque diaper in relief, the face of the ornament almost entirely gilt, whilst the grounds enclosed by the leading lines of the ornament are coloured blue, red, green, and white. The whole is most rich in effect, although, unfortunately, the building is in a very ruinous state. As it is a fine example of the "Kubbet," I will continue a description of its interior ornamentation.

Below the cupola windows is the usual frieze of writing, on red ground, under which runs an Arabic fret border. From this line the pendentives commence, and the construction of these is very uncommon. Across each angle of the square is thrown a plain pointed arch, the apex of which meets the ring of the dome. The archivolt is in red, white, and black stones. The curved face of the pendentive is decorated with flat relief arabesque in stucco; light on a coloured ground; as also are all the plain wall faces in the same story. The alcove, which is recessed to the angle, is the remarkable part of the pendentive, being constructed on the system of fan-vaulting and meeting in an octagonal alcove. Another fret border or string course is carried round the building from the springing of the pendentives, —the pointed windows in the angles breaking it, —whilst those in the lunettes range above it. The walls of the next lower story are very ruinous, but seem to have been nearly plain, with a dado of marbles inlaid in narrow upright panels; possibly the wall was lined with tiles, or painted with coloured designs; but this is only surmise.

The flat ceilings, whether of mosques or other public or private buildings, are treated, without distinction, in one of two or three ways. The handsomest, producing the richest effect, is the beam and panel arrangement already described, which seems to have prevailed largely in mosque, sebeel, or dwelling. The finest examples are to be met with in the "Moaiud," "Mahmoudie," and "Kaidbai" mosques; in some of the older sebeels; and in the houses "of the Sheikh, of the Mufti," and "Ebn e' Sadàd," both before referred to. There are, however, many others in the older private houses, but they are difficult to find out and not easy of access, great numbers of the older houses having been destroyed during the last few years.

A simpler form of ceiling is that formed by "beam and match boarding." Here the boarding is probably placed diagonally, and the narrow boards are painted successively in various colours, with perhaps a running pattern of conventional flower ornament, or arabesque, on each —the beam being elaborately decorated (as in an example at Damascus); or the beam is decorated with rich diaper or geometrical pattern, and the boarding painted in panels without the division of framing.

The flat ceilings in which the beams do not show, but which are divided by small mouldings into elaborate geometrical panels, more or less decorated in colour, are of great variety. As I have already incidentally mentioned, they occur in buildings of all descriptions, and are used both internally, as the ceilings of rooms, and externally, in the soffits of the "Mushrebeeyehs," or other wooden structures. Occasionally these are elaborated and enriched by bold pendents marking the central points of the device; and in some instances this system is combined with the beam treatment, as in the entrance corridor to the old "Morostan," at Cairo. There we find the ends of the beams cased, and ornament is carved on the casing. In the same place is a good specimen of wooden cornice formed of a series of polygonal pendentives—a style of cornice to be met with both in Cairo and Damascus (House of Assad Pacha). The most frequent form of interior cornice, in large buildings, is the bold hollow or cove which is divided by coloured decoration into ornamental panels, with rich borders. Korán sentences, in white and gold, on rich blue grounds, are often introduced in these panels, the surrounding colouring being in more subdued tones, and the top and bottom lines of the whole cornice being strongly marked with black and white, bright red, or other vigorous colours.

Below the cornice is usually a frieze, almost always of writing. How beautifully the Arabic character lends itself to ornamental purposes is well known. Probably in no other style of art has writing been so largely used for this end. For, whether externally or internally, wherever there is a frieze in an Arabic building, it consists of writing. Beautiful effects are produced by intermingling the character with delicate scroll work, the latter being gilt, and the writing white, both on a blue ground, as in the "Mahmoudieh" Mosque at Cairo. And the writing itself is often wrought into ornamental monograms, whole sentences being so entwined as to be difficult, even for the expert, to decipher. The same use of writing extends to every object in which Arabic ornamental art is expended. Witness their metal vessels, in which the whole surface is frequently covered with inscriptions. The practice doubtless originates in the preclusion of the representation of animal life; the instinct of the artist to appeal, in some direct way, to the understanding and sympathy of the beholder being too natural and too strong to be altogether repressed.

I have already alluded to the use of coloured marble inlay, and tiles for the internal wall decoration. At Damascus the taste for mosaic decoration was evidently very strong, much more so than at Cairo; and the examples of real and imitation mosaic are of untold variety. A mosaic of geometric or other ornament, cut perhaps a quarter of an inch deep in the stone, and filled with hard cement of various colours—black, red, blue, or yellow—was also in extensive use with very excellent effect. I must also notice that, at Damascus, interior coloured decoration, of essentially *Persian* character, exists in considerable quantity. Here the walls are divided into panels by bands of rich colour, the ornament being in slight relief, and gilt or silvered. But this is late, and cannot be considered as pure Arabic work. There is another branch of interior ornamental work, which is of infinite variety, and deserves much study. I have already remarked that wood, as a material, must be considered scarce in the region of Arabic architecture. Not only this, but a climate of extreme dryness and extreme temperatures makes its use, in large sizes, difficult or undesirable. Probably, from these causes, all Arabic woodwork is made up of a number of small parts, framing and panels, ingeniously wrought into every variety of rectilineal form and design. Doors, panels, window-shutters, cupboards—all are made after this fashion; and no two seem to be alike. I agree with those who consider that to this system of woodwork may be traced the wonderful variety of geometric design applied to all materials by the Arabs and Moors. A workman at Damascus showed me a scroll in his possession, containing about two hundred traditional designs of rectilinear geometrical forms for wooden panelling. This panelling usually has the narrow framing moulded, and the panels bevelled at the edge. The panels are sometimes left plain, sometimes are painted; but they are also, as you see, occasionally inlaid with ivory or pearl.

The richest specimens, and those most elaborately worked, are also, as I believe, the oldest. These are the screens in the Coptic Churches of "Fostàt," or "Old Cairo." In some of these the wooden panels are delicately and minutely carved; in others the panels are inlaid with ivory as ornament; or again the ivory, let in, is itself carved in elaborate arabesques. Even the full-sized drawings which I show of these screens give but an imperfect idea of the minuteness and delicacy of the work; and it must be borne

* believe that, until about a hundred years ago, tiles of this description were still manufactured at Damascus.

in mind that each panel, and each straight piece of framing, is a distinct piece of wood; and that, moreover, in the original each screen contains several superficial yards of such work. This style of woodwork is now almost extinct. A few workmen, and only a few, are still to be found at Damascus, where, in the richer houses, there is yet a limited demand for it; but it is no longer in general use. The pretty and characteristic furniture, inlaid with pearl, is still found in Arab households; but all Arab art virtually belongs to the past. It is rapidly being pushed aside by the garish and tawdry products of Southern Europe.

It is melancholy to feel that almost every example I have quoted is a portion of a ruin, or is doomed to ruin by those sure destroyers, neglect, apathy, and selfishness. Monuments worthy of world-wide fame are dropping to pieces, either by utter disregard, or by dishonesty, or by the mildew of a fatalism which *never repairs*. Inquiring once of the Imám, or priest of a mosque, why, since a devout man had built so beautiful a structure to the glory of God, no good man was found to keep it in repair, I received this reply,—"Truly he was a good man who built this place for the worship of God; but it now belongs to God, and, if he wills it so, it will surely crumble and fall. It is as God pleases!"

Such is the Mahommedanism of to-day. We may well look around and ask these ruins if it was such when they were in their splendour. Did they who built them look for this? Was he, who, from the Mosque of Tooloon—just a thousand years ago—called the faithful to prayer, even such a one as the blind Mueddin, who, to-day, from the crumbling minaret, sends a wailing voice over the city as he cries (sadly, as it seems), "God is most great! There is no deity but God! Mahommed is God's apostle. Come to prayer—come to security! There is no deity but God alone!"

NEW POST-OFFICE FOR NEW YORK.

THE new Post-office which has been commenced in New York is of large size, and has considerable pretensions. It is being erected on the triangular portion of the Park at the junction of Broadway with Park-row. It will have a frontage on Broadway and Park-row of 262½ ft., 144 ft. on the south-west front, and 279 ft. toward the Park, the plan conforming to the shape of the ground, enclosing an opening or court. There will be three stories, together with basement, sub-basement, and attic. As to the interior arrangement, the sub-basement includes the whole area of the building and that portion of the side-walks covered by Hyatt lights, and bounded by the retaining walls, and will accommodate the furnaces and necessary machinery, coal-vaults, &c. The entire basement will be used by the Post-office Department, and, like the sub-basement, includes the whole area within the retaining walls. It will be well lighted by the Hyatt light side-walk, and the illuminated floor in the principal story.*

The principal story of the building will be devoted to the use of the Post-office Department. It has no interior partition walls, the official and public spaces being separated by the screen formed by the Post-office boxes, the whole of the walls above being carried on iron columns. The court-yard will be covered by a roof of iron and glass, so that the whole of the space inclosed by the outer main walls of the building will be utilised.

There are to be seven doors on Broadway, a like number on Park-row, and three on the south front, with ample corridors. Four hoistways are provided.

The floors are to be formed of rolled iron beams carrying brick arches, the haunches of which are to be filled with concrete, on which is to be laid the marble tiling, or board flooring. The roofs will be constructed of iron, covered with slating and copper.

The style of the building is to be the Renaissance, each story being carried up in a distinct order in the Doric style, increasing in richness as the top is reached. The roofs are to be carried from the main cornice, and crowned with iron railing. On the four principal angles hexagonal pavilions will be erected; these will conceal the awkwardness of the angles which the form of the lot entails on the building. In the centre of the Park-row and Broadway fronts, pavilions are to be carried up, crowned with finely-proportioned square Mansard roofs.

At the south-west end, or apex, the whole frontage between the hexagonal pavilions is to be thrown forward to form a grand mass 87 ft. wide, which is to be carried up and crowned with a dome. The central pavilion is to be of similar design, and is to be connected with the corner pavilions by curtains similar to those on the Park-row and Broadway façades.

* These Hyatt lights, we may usefully mention, consist of lenses fixed in a skeleton frame of iron, the whole strong enough to form a footway, landing, or staircase. The patentee is Mr. B. F. Stevens, of Henrietta-street, Covent-garden. In many cases where light is of consequence they might be usefully introduced.

"PETRIFIED CONCRETE."

SOME works have recently been established in the neighbourhood of Victoria Park for the manufacture of artificial stone by a new process. The *Pharmaceutical Journal* says:—"It has been known for some time that Portland cement, or any concrete containing lime, can be rendered extremely hard by immersion in a solution of silicate of soda. Under these circumstances, the silica is absorbed by the lime, and the cement thereby converted into a true stone. But the cost of the silicate of soda has hitherto rendered such a process too expensive for general application. The proprietor of the works we refer to has overcome this obstacle in a most ingenious manner. Beneath the chalk beds of Surrey, in the neighbourhood of Farnham, there exists a plentiful deposit of a soft stone, containing 25 per cent. of silica, in a condition in which it is soluble in a cold solution of caustic soda. This material the inventor grinds up and diffuses through the bath of silicate of soda, containing the concrete to be petrified. The lime, removing silica from the solution, liberates caustic soda, which dissolves fresh silica from the Farnham stone. The process thus becomes a continuous one. The soda acts as a carrier of silica from the stone to the cement. By due care, the solution of silicate of soda may be maintained of constant strength, and is therefore capable of performing an almost indefinite amount of work. The expense of the silicate of soda being once defrayed, the cost of 'petrifying' the concrete is simply the value of the Farnham stone, and the labour of applying it. No heat is required in any part of the process, and the work is therefore very simple."

THE CLARENDON PRINTING HOUSE, AND THE ASHMOLEAN MUSEUM, OXFORD.

RECENT historians of Oxford, beginning with Chalmers in 1810, assert that Sir John Vanbrugh was the architect of that noble edifice in Broad-street, Oxford, long known as the Clarendon Printing House, which was built in the years 1712 and 1713. Ayliffe, a contemporary writer, in his "Antient and Present State of the University of Oxford," published in 1714, ascribes the design to "that ingenious artist of a mason, Mr. Townsend, of Oxford." Townsend, however, was only the builder; the architect was Nicholas Hawksmoor, one of Wren's pupils, who was also employed for the south quadrangle of Queen's College, and for the north quadrangle of All Souls' College. The Minute Book of the Delegates of the Press contains the following entry, under date of October 3rd, 1715:—"Mr. Vice-Chancellor proposed to gratifie Mr. Hawksmoor for his care in drawing and supervising the whole worke of the new Printing House. Agreed to give him 100*l*." This entry deserves notice for the use of the verb *gratify* in the sense of giving a *gratuity*, and as showing that architects had not at that time established a claim to any stated payment as "commission" for their services.

Another building in Broad-street, the Ashmolean Museum, which was finished in 1683, is ascribed by the same recent historians to Sir Christopher Wren himself. Yet in the "Parentalia," compiled by his son, and published in 1750 by his grandson, although one chapter of the book is given to "a Catalogue and Account of Designs of Buildings [by Wren] in the Universities of Oxford and Cambridge," no mention is made of the Ashmolean Museum. The account books of the University contain no entry of any payment made for the building of the Museum except to a "Mr. Wood:" and positive evidence that he was the architect, as well as the builder, is furnished by a view of the east end of the Museum, "drawn, engraven, and sold by M. Burghers, in St. Peter's-the-East, at Oxford," in 1685 or 1686, which has "T. Wood, archit.," at the foot. Thomas Wood was employed by the University as a worker in marble, and as a sculptor on two or three occasions, and might be described as "that ingenious artist of a mason," quite as justly as the Mr. Townsend who built the Printing House twenty years afterwards; but I am not able to point out any other building erected by him. A DELEGATE OF THE PRESS.

THE METROPOLITAN WATER SUPPLY.

AT the last meeting of the Metropolitan Board of Works, the debate on the motion of Mr. Freeman—

"That the Chairman be requested to seek an interview with the Home Secretary, for the purpose of inquiring whether it is the intention of the Government to bring in a measure founded upon the report of the Royal Commission on Water Supply; and also to place before him the Board's general approval of the report,"—

was resumed by Mr. Richardson, who moved as an amendment,—

"That the Chairman be requested to inform her Majesty's Government that the Board, having considered the report of the Royal Commission on the water supply of the metropolis, are of opinion that there should be a constant supply of pure and wholesome water; that the existing supply is not satisfactory; that the Board are not prepared to express any opinion as to the desirability of the water supply being transferred from the companies to the municipal authority; but that, if Parliament should determine that it would be expedient that the water supply of the metropolis should be in the hands of the municipal authority, the Board would be prepared to undertake the duty."

After some discussion, the amendment was put and negatived, only one hand being held up in its favour, and the original motion was then put, and on a division was carried by 21 to 10.

REGISTRATION OF DISEASE.

ONE of the most important obstacles in the way of satisfactory sanitary legislation has always been, and still remains, the difficulty which thinkers and writers upon the subject experience in deciding what to ask for. Whether the result of the labours of the present Sanitary Commission will be conclusive to define these desiderata, remains to be seen. In the mean time, and pending the deliberations of this Commission, public opinion has, as if by common consent, fixed upon one or two requirements as necessary to strengthen the hands and increase the usefulness of health-officers, and other authorities having more or less directly the charge of our local sanitary administration. Not the least of these is the registration of disease.

It requires but a very superficial consideration of the subject to be convinced, that however useful the registration of the causes of death may be to afford the means of judging of the past sanitary condition of a community; the registration of disease would be far more likely to afford the means of arresting an epidemic, as the first cases of attack would thus be made known to the authorities, probably some days before a single death would be registered. As the medical profession, the large proportion of health-officers, and a considerable number of the most able writers on sanitary matters are almost unanimously in favour of registration of disease, the subject acquires just now additional importance.

We have before us a short pamphlet on "National Returns of Sickness,"* which concisely, and in a practical manner, shows how such returns might be obtained, and rendered available for the public use. This cannot fail to be useful at the present time, as the most dangerous opponents of the registration of disease have been those who seek to surround the proposition with a host of imaginary practical difficulties.

The author of the pamphlet is careful to state in his preliminary remarks that "the proposals in this paper are entirely confined to cases of sickness occurring within the practice of Poor-law medical officers, and of the medical officers of charitable institutions." The difficulties in the way of attempting to deal with cases of sickness arising in private practice would be, certainly for the present, insurmountable; and, moreover, the origin of epidemics of zymotic disease can almost invariably be traced to the very classes whose sickness under the present proposition would be registered.

The gist of the proposal is that Poor-law

* "Suggestions for National Returns of Sickness," by James Lewis, of the Registrar-General's Office, Somerset House. Published by C. P. Alvey, 31, Museum-street.

medical officers, and medical officers of charitable institutions, should furnish on a uniform system returns to a centre office in London, where they would be tabulated, and presented to the public with the least possible delay.

The pamphlet gives some valuable and interesting particulars as to the extent of the information which would thus be made available. It appears that there are in England and Wales somewhat more than 3,000 Poor-law medical officers, who, according to an estimate made by Dr. Rogers, the president of the Poor-law Medical Officers' Association, treat on an average 3,500,000 cases of sickness per annum. An estimate of the number of in and out patients treated annually by the "numerous medical charities undertaking the gratuitous, or semi-gratuitous treatment of disease," adds another million and a half, making in round numbers an aggregate of about "five million cases of sickness per annum as occurring in the *public* medical practice of England and Wales." Nearly the whole of these five million cases occur among the very class which contributes most largely to the excess of death-rates, and in which for the most part are originated all epidemics of zymotic disease. There can be no two opinions as to the value, from a sanitary point of view, of a register of the sickness occurring among so large a portion of the population of England and Wales.

It is wisely, and very strongly recommended, that the forms to be used for transmission to the central office should, in the first instance, be of a very simple character, in order that the labour both of filling them up, and preparing them for publication, should be as much as possible kept within moderate limits. This is the more necessary as it appears very desirable that the medical officers should themselves fill up and transmit these returns. To ask those gentlemen to furnish a variety of particulars, many of which would probably never be fully given, which would thus render the returns incomplete, would be to defeat the object in view.

There can be little doubt that the value of such published returns of sickness as are here proposed would to a great extent depend upon the promptness with which the returns could be made available to the public. The recent deputation to the President of the Poor Law Board on the subject appears to have proposed *weekly* returns to the Central Office, but only an *annual* publication. The Medical Officer of the Privy Council is in favour of a *quarterly* return. We quite agree with the author of the pamphlet under notice, when he says that "if a return of new cases of sickness is to be of any use to the Central Sanitary Authority, it should be made as frequently as possible; not more seldom than once a *month* certainly, and preferentially once a *week*." We are decidedly of opinion that nothing less than a *weekly* return would answer the purpose in view. A less frequent return would result in this anomaly, that as regards all large town centres of population, the Registrar-General would publish the deaths arising out of the cases of sickness, of which we should not receive information until the end of the month, quarter, or year, as the case might be, and long after the return could be of any possible sanitary use, except as a contribution to the history of disease.

A perusal of the pamphlet in question will satisfy most readers as to the thorough practicability of such a national return of sickness, and we must wait for the report of the Sanitary Commission in the expectation and hope that it will contain a strong recommendation for the publication of some such returns of sickness as are suggested in the paper before us. In the meantime we are convinced that in urging the support of all those interested in sanitary science for some well-organised system of registration of sickness, we are helping on a cause which has been so long and so often advocated in these columns.

DEATH BY SUFFOCATION, AND ITS RESPONSIBILITIES.

WITHIN the short space of four weeks no fewer than thirty-three persons have had the breath of life literally squeezed out of them, or, as the juries termed it, have died from suffocation. This is a very unpleasant subject to dwell upon, but at times it becomes our duty to ventilate these unpleasant subjects; the more so, as in this instance there is a most uncomfortable deduction to be made from these lamentable occurrences. The profession we represent is ever ready, and justly so, to take a fair amount of credit to itself for the benefits it undoubtedly has bestowed upon mankind: and shall it not, then, take equal blame when it has left undone the good it might and ought to have done? We think it should and will; and, thinking so, we can make no apology for plainly speaking the unvarnished truth,—that the profession as regards these horrid slaughters has been, in however remote and limited a degree, tainted with the crime of manslaughter. Before, however, throwing out any suggestions for the removal of this taint, it will, perhaps, be well briefly to consider the causes of these two catastrophes, the means by which they ought to have been prevented, and the lesson they teach us with regard to our huge assembly-rooms in the metropolis. The causes are easily explained after the results; truer wisdom it is to see and avert the causes before. The meeting of two crowds of people, or the division of one (both of which occurrences take place nightly in London on a much larger scale), have, coupled with the small or unequal sizes of the passages, led to these many deaths. Engineers tell us that in conveying water through pumps and pipes the great object to be attained is sufficiency, and uniformity of size in the passage; if contraction or enlargement is made, the water becomes troublesome and unruly, and loss of power ensues. It is so with a stream of people, and we can only prevent these so-called "accidents" for the future by following out in our buildings this engineering axiom. Had this been carried out in the cases before us, how much heartrending sorrow would have been spared.

We must not lose sight of the fact that these calamities might have been far worse; if so many were killed at Bristol in trying to gain access to pleasure, how much greater the number would have been had they been seeking egress from fire and destruction.

The third point under consideration is a very serious one, and one of which it is difficult to over-estimate the importance.

To demonstrate our case more clearly, suppose we put it in the form of an ordinary rule-of-three sum. If in a small parochial assembly seventeen lives are lost during an unfounded panic, how many would be lost in one of our large metropolitan halls (Exeter or St. James's, for example), if a panic occurred for which there was good cause, or in case of actual fire?

We shudder at the bare idea of a correct answer to this question, and we imagine that even the most devoted worshippers of Bowannee would likewise impiously (we had almost said piously) recoil from the wholesale slaughter which would certainly take place.

Let us look at the means of egress from Exeter Hall, though we do not wish it to be imagined for a moment that we are making an exclusive raid upon this hall; there are many in London as bad, and some far worse. The only practical door in case of fire, &c., is that on the south side leading direct into the Strand, which would afford a means of escape to a few in the body of the building; the gallery people would have but a slender chance of flight, while the chosen 700 in the orchestra would inevitably miserably perish; and yet, when the attention of the authorities was called to this prior to the re-decorating, they refused to take any steps for the safety of the public in their charge. There are many who never enter these London halls from a dread of the certain death which would be their lot in case of panic. We have spoken of the disease almost an epidemic which pervades our halls; let us now turn to the pleasing task of suggesting the remedy. There is no Act of Parliament which obliges architects so to construct buildings, that when crowded with people in a state of panic, they can be emptied in a given time. There should be, and no building ought to be licensed until the conditions which this Act should contain were complied with. Let a committee of the leading architects and builders be formed to consider what should be embodied in such a clause, and submit the result to the Board of Trade. In this way, and this way only, we think the profession could free itself from the slight stain of which we have spoken: humanity itself demands the step, and we trust the numerous members of our profession possess those higher, purer, and more disinterested motives which will make this duty a pleasure to all. In the meantime, and till this much-to-be-desired object is attained, we should wish to impress upon our readers two saving maxims to be strictly adhered to in case of panic or fire. Never move from your seat until you have arranged and resolved on your course of action, both with yourself and those around you; and' if, being near the door, you think it well to go out do your utmost to clear a space in the street round the door.

W. F. C.

A VILLA OF CONCRETE.

FERNLANDS, CHERTSEY.

THE use of Portland cement concrete as a building material goes steadily on. We illustrate in our present number a villa residence of considerable size, the walls of which are entirely constructed of it. This building, known as Fernlands, is nearly completed; it stands on a rising ground, about a mile from Chertsey, Surrey, and forms a somewhat prominent feature in the landscape from the rail, as the town is approached from the London side. The concrete of which it is built is composed of gravel and sand, dug on the spot, and Portland cement, in the proportion of 7 of gravel and sand to 1 of cement. Some portions, such as the terrace walls, are composed of 9½ of gravel to 1 of cement, and this latter proportion is found to make a good wall. Hoop iron is used in the walls as a tie.

The apparatus employed in the construction is that patented and manufactured by Messrs. Drake, Brothers, & Reid, of London: it is easily adjusted to any shape or height of wall. The walls were built by the proprietor of the estate, Mr. J. Madocks, who employed his own workmen. The contractor for all other portions was Mr. B. E. Nightingale, of Lambeth.

The building consists of basement, ground-floor, and first and second stories. The large central hall, shown in the plan, is continued up to the roof, with balcony round on first floor, and is lighted by a lantern, somewhat elaborately ornamented with carving, gilding, and stained glass.

There are in all twenty-two rooms, besides conservatory, pantries, and larders. The pilasters (2 ft. on face by 3 in. projection), at each angle of the main building, and of the tower, were built up together with, and form a part of, the walls; and the walls are decreased in thickness on each floor, being 14 in., 12 in., and 10 in. The chimney-breasts, being large on the ground-floor (kitchen fireplace especially so), were reduced in size on the chamber floor, the adjustability of the apparatus allowing variations of this kind to be carried out at will. The pilasters to front doorway and shafts of the windows above it are of stone.

The building is heated by air, warmed by contact with earthenware, conducted mainly through flues formed in the body of the concrete walls, and admitted by sliding valvular gratings in the skirtings of the several rooms.

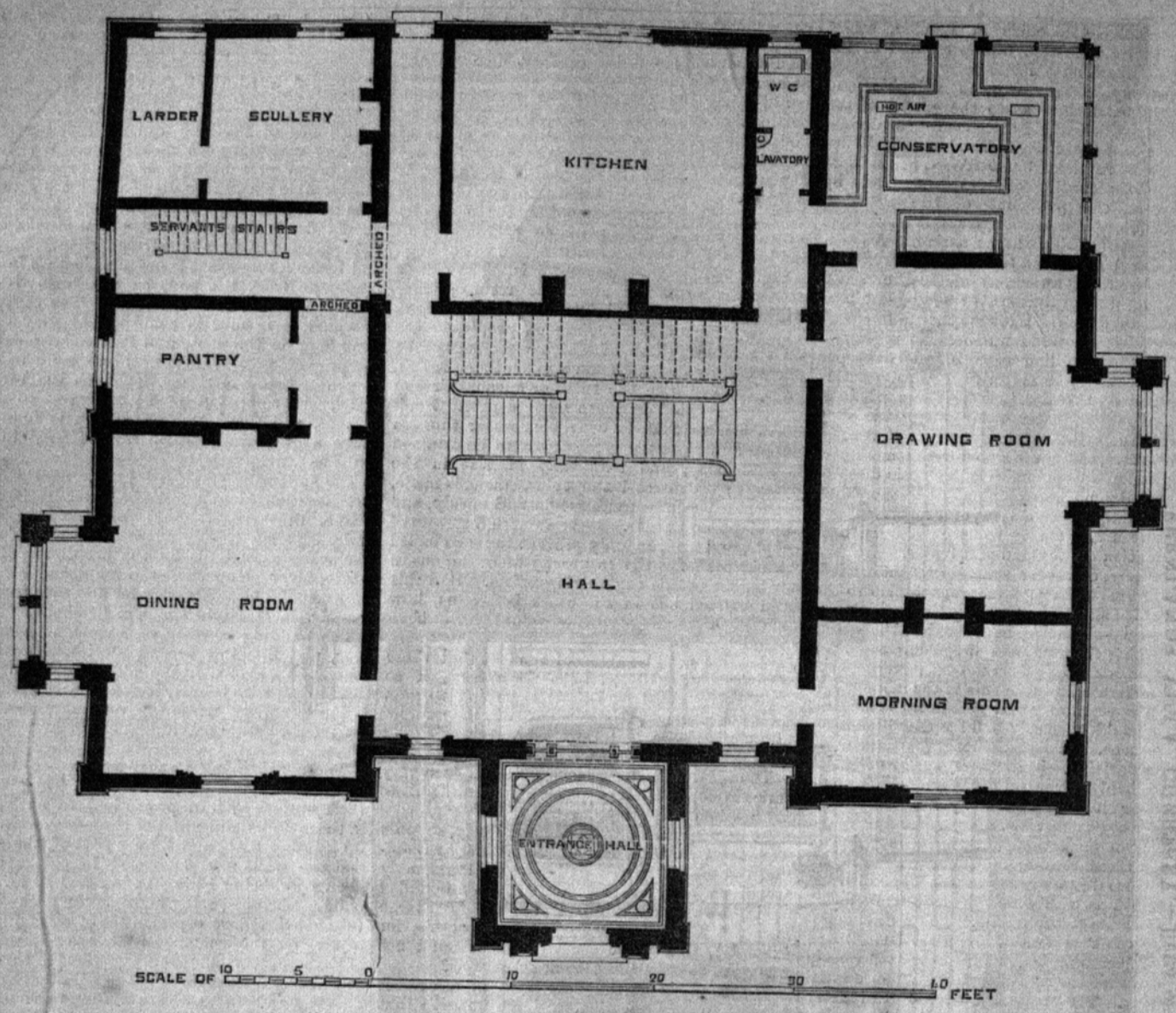
Ventilation is provided for in every room by distinct flues, formed in the concrete, and entered by apertures near the ceilings. The bells are Moseley's electric; and the closets are all of Moule's patent.

The architect considers the construction perfectly successful, and it may be taken as a proof that concrete is a suitable material for buildings of any class or size. With the apparatus used, battering as well as perpendicular walls have been constructed, and we have every reason to believe that with due care and intelligence, and with good cement, walls of any shape, height, or inclination, can be successfully carried up in this material. Bad concrete is utterly worthless: with good concrete properly applied, sound and economical buildings may be constructed.

The strength of the walls of this building was very satisfactorily demonstrated. During the construction it was determined to form a doorway in one of the inner walls. The concrete was cut away with a pickaxe to the required size, except in the middle, where a beam of concrete was left, 3 ft. 4 in. long, 9 in. deep, and 9 in. thick. This beam, a perfectly straight one, had along the middle of it one of the horizontal joints which necessarily occur between the layers of the concrete, but no bond of iron hooping. This beam was tested with a weight of 25 cwt., hung on its centre. After bearing the strain for twenty-four hours, the foreman jumped on it, but without effect, and it had after this to be demolished with a pickaxe.

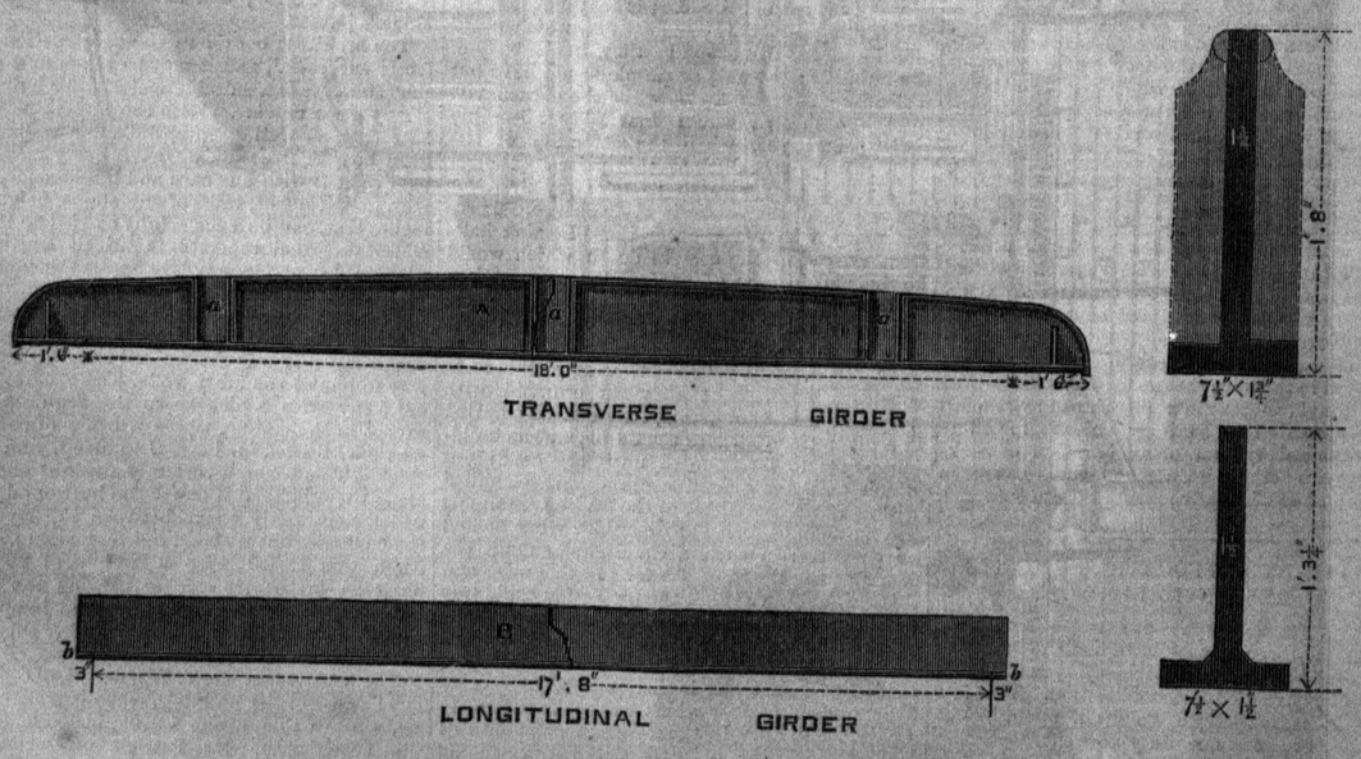
The architect is Mr. T. Wonnacott, of Chertsey.

The cost of the building, when completed, will be, we are told, about 4,000*l.*, including stables and coachhouse. Mr. Patrick, of Dover-court, near Harwich, supplied the cement for the concrete walling; and Messrs. J. B. White, Brothers, of London, supplied the cement for the exterior work.

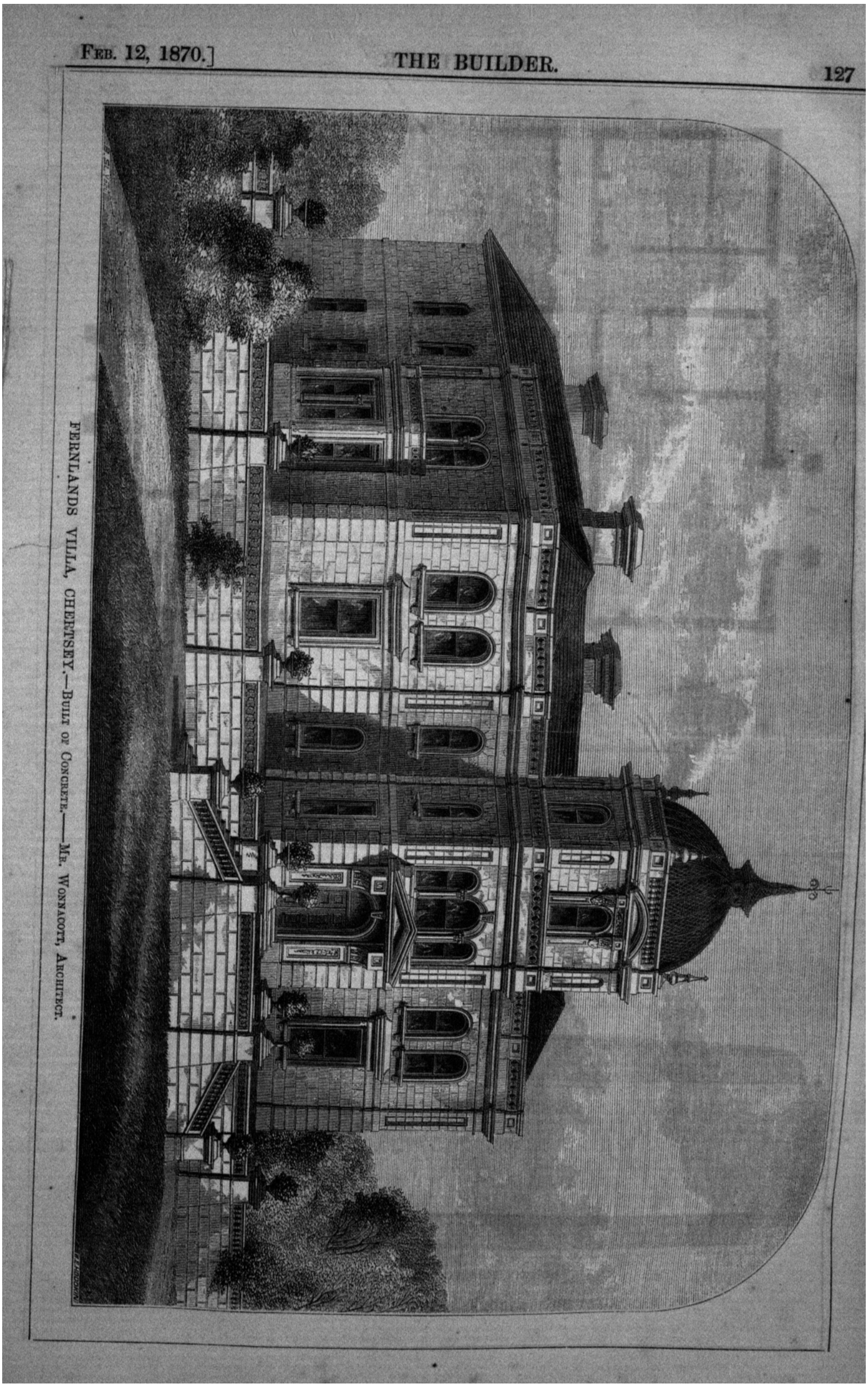


A CONCRETE RESIDENCE, CHERTSEY.

Plan of the Ground Floor.



CAST-IRON GIRDERS, KING'S COLLEGE, LONDON.



FERNLANDS VILLA, CHEETSEY.—BUILT OF CONCRETE.—MR. WONNACOTT, ARCHITECT.

CAST-IRON GIRDERS, KING'S COLLEGE, LONDON.

WE mentioned in our last that some of the girders from the dining-hall, King's College, similar to those which had failed there, had been broken by the hydraulic press, in the yard of Mr. George Dines, with the view of ascertaining their strength. Reference to the account we printed at the time of the catastrophe * will show that the flat was formed by three cross girders, with longitudinal girders resting on them, and on the end walls. Our illustrations represent one of each of these, A and B, elevation and section. *a* shows the cast pockets on the transverse girder, to which we referred at the time; into these the dovetailed ends of the longitudinal girders, *b*, dropped, the top flange being there omitted, as shown on section. The bearing of the transverse girder was 18 ft.; the height in centre, 1 ft. 8 in.; the web was 1⅜ in. thick; and the bottom flange, 7½ in. by 1¼ in.

Pressure being applied, the girder broke through the pocket, as shown, with 40·9 tons pressure in centre. The girder B, broke as shown, with 27·5 tons in centre. The iron of these two particular girders must be considered good. Whether or not it was so in all is another question. At the time of the accident the girders A were loaded with about 25 tons each in the centre; the girders B with 7½ tons.

BEXLEY HEATH CHURCH COMPETITION.

WITH reference to this unfortunate and ill-managed affair, we have received from Mr. H. E. Marsh, late chairman of the committee, a statement of the reasons which led him and five other members of it to resign on the determination being come to to adopt the design marked No. 1, by the architect who was called in to assist in making a selection. The church required is to seat 900 persons, and to cost 4,500*l.* exclusive of tower; and if it be correct, as stated, that the design now determined on includes a chancel nearly *sixty feet long*, we can have no hesitation in applauding Mr. Marsh's opposition. It is an absurdity, or worse, and the sooner the subscribers outside interfere the better. The fact that the late chairman has subscribed 300*l.* towards the erection of the church, and was engaged in raising that amount to 1,000*l.*, by application to friends, seems to show real interest in the undertaking.

LECTURES FOR WORKMEN.

THE lectures on "Ornamental Ironwork," to be delivered by Mr. J. M. Capes, M.A., at the South Kensington Museum, and especially addressed to workmen, promise to be well attended and to be serviceable. The first, which was given on Monday evening last, was listened to by at least 350 persons, the great bulk of whom were practical workmen.

Mr. Capes began his introductory lecture by remarking the obvious, although extraordinary, fact that, in 1870, any very pressing invitation should be required to draw together a large audience of English workmen, in order that they might be told something about that which, above all other matters, they ought to be thoroughly well acquainted with,—namely, the use of iron in every possible way of employing it. Notwithstanding the general use of iron for the purposes of modern civilisation, and for almost all the needs of life, except food and clothing, the study and practice of ornamental ironwork were in a very unsatisfactory condition. The lecturer traced the causes of a lamentable decay in what was once a great national industry, to the debasement of public taste, rather than to the absolute want of highly-skilled artisans; and he dwelt forcibly on the baneful effects on art arising from the universal substitution of the low mechanical system of casting iron for the higher process of forging it. This substitution, he argued, had led to three specially injurious results. First, it had introduced unsound ideas of construction, inconsistent with the essential nature of all metal work. Secondly, it had banished the peculiar beauties in which iron stands pre-eminent over wood, stone, earthenware, and other non-metallic materials. Thirdly, it had fostered carelessness in workmanship, and reduced the workman to the level of a mere machine. All sound design, he contended, was based upon the rule that beauty is to be attained by the decoration of structural forms designed for practical use in accordance with the special qualities of the particular material employed; and all natural beauty is attained by the observance of this rule. The lecture was illustrated by examples of ironwork borrowed from the collection in the Museum. In conclusion, Mr. Capes argued that the revived study of ornamental ironwork on sound principles could not but be of the highest importance to the English artisan, because it is through his personal skill that a material, in itself of a low market price, acquires a great and permanent value; and he drew a striking contrast between the life of the true artist-workman and that of the uncultivated artisan of the modern foundry.

The series will be continued weekly for five successive Mondays, each lecture commencing at eight o'clock; and we hope the opportunity here offered of learning something about principles, for a merely nominal fee, will be largely taken advantage of by those for whom the lectures have been expressly provided.

* Vol. xxvii., p. 977.

DERIVATION OF THE WORD "IRELAND."

CAPTAIN BURTON ("Pilgrimage to El Medinah and Meccah," 1856. Vol. iii., p. 335, n.), writes: "May not the Phœnicians have supplied the word 'Irr,' which still survives in Erin and Ireland? Even so they gave to the world the name of Britain, Brettanike, Barrat et Tanuki, the land of tin. And I should more readily believe that Eeran is the land of fire, than accept its derivation from Eer (*vir*) a man."

Also, "Ur of the Chaldees (whence the Latin *uro*), becomes in Persian 'Hir'; in Arabic, 'Irr.'"

What is the passage in Claudian mentioned by "A. H." in the *Builder* for January 22nd?

Has the word *Ierne* been traced from the fifth century onwards?

How and when did the word as we now have it first appear in England? S. F. C.

NEW SCHOOL AT BIRMINGHAM WORKHOUSE.

THE erection of a new school for boys at the Birmingham Workhouse is so far completed that it will be taken possession of in the course of a few days. The new building, as seen from the main road, is three stories in height. It is built of brick, and in a Gothic style, corresponding to the other portions of the workhouse. The new school and its belongings partly occupy two sides of a quadrangle, the remainder being play-ground. The cost, exclusive of land, is between 9,000*l.* and 10,000*l.*, and the land, we believe, was bought for something like 1,500*l.* The lower part of the conspicuous building seen from the road comprises the school-room and day-room, or room for the boys when not in school. The latter room is lighted up by a row of windows on each side. It is 102 ft. long by 30 ft. wide, and of ample height. Over it is a dormitory, of similar dimensions and appearance, and the top story is a dormitory of the same length and width, lighted by dormer windows, and relieved by circular ribs of stained deal, which support the roof. The school-room, occupying a corner, is irregular in shape, something like the letter F, without the second stroke. In the long direction it is 50 ft. long by 30 ft., and in the other or top piece it is 19 ft. by 58 ft. Adjoining the school-room are three class-rooms. Upstairs there are dormitories, rooms for the schoolmaster (one overlooking the lower dormitory), superintendents of labour, &c. In a room on the ground-floor, 22 ft. by 26 ft., there are rows of basons fitted, at which the boys wash after leaving their dormitories. At one end of the lavatory are baths, in which every boy receives his weekly wash. Then there is a swimming-bath, 26 ft. by 15 ft. 9 in. The other buildings form part of the second side of the quadrangle, and consist of a dining-room, a tailors' room, and a shoemakers' room. The dining-room is 60 ft. long, 30 ft. broad, and 22 ft. high.

The trades taught in the workhouse are tailoring and shoemaking, and for the practice of each of these handicrafts there is a room 35 ft. by 23 ft., besides store-rooms and rooms for the industrial teachers overlooking the workshops. The remainder of the quadrangle is to be used as a playground, and it is 280 ft. long by about 200 ft. wide. On the school-room side there is a covered shed, 50 ft. by 16 ft.

The architects are Messrs. Martin & Chamberlain, and the builders Messrs. Jeffries & Pritchard. The whole of the new buildings, like the rest of the workhouse, are ventilated, and they are warmed by steam pipes. It is contemplated to appropriate the rooms about to be vacated by the boys to male epileptics.

The average number of boys in the workhouse is about 270, and the entire population of the pauper colony is considerably over 2,000.

CANTERBURY NEW WATERWORKS.

THE engine and boiler-house, coal-store, chimney, cooling pond, softening and lime water reservoirs, boundary walls, permanent pumping engines, pumps, and boilers, are all so far finished that the permanent pumping-engine, pumps, and boilers, have been in use for some weeks past to pump up the spring-water from one of the two bore-holes. The quantity of water raised from the bore-hole, by the new pumping-engine, has been at the rate of 1,000 gallons per minute, equal to about one million gallons and a half per twenty-four days.

The normal level of the water in the bore-holes is now 9 ft. above the level of the water in the river Stour, at the Silver Hole spring at Wincheap, and, when yielding a supply at the rate of 1,000 gallons per minute, this level in the bore-hole is only temporarily lowered about 22 ft., the water at once rising again to the normal level directly the pumping is stopped.

The object of the present pumping is to clear out the soft chalk, &c., from the subterranean fissures that yield the spring-water, in order that the water may come up clear and free from chalk in suspension.

On Tuesday, the 18th inst., this reservoir, which is 19 ft. 6 in. deep, and capable of holding 350,000 gallons, was quite filled with water to the overflow, and, on carefully testing, it was found that the reservoir was quite water-tight. The water-tightness of the 12-in. main pipe is now being tested throughout its whole length.

AN APPEAL FOR THE BUILDING TRADE.

SIR,—No one connected with building concerns but must acknowledge the justice of the touching description by your correspondent "Builders' Foreman: a Mason" in your last number, of the sufferings which the trades are now undergoing, and the privations they now endure from the collapse in building operations. Surely this subject must be taken up by the Government, for the pressing necessities of the people ought to be the first care of our rulers; and it is in their power, without any excess of principle, to give work and occupation to the mechanics and business to the trades with which they have to do. The nation gave twenty millions for the manumission of the slaves without any return; they properly contributed many millions to relieve the starving Irish during the famine. I have to propose a scheme for the metropolis, by which they should have an equivalent for their outlay. There are many building operations in London which have received the sanction of the Legislature, but in which there appears to be a stand-still on the part of the Administration, who seem to think that the economy of a great nation consists in doing little or nothing,—in avoiding to spend money to meet urgent necessities. However, let me ask, when are the Law Courts to be commenced? What has justified the delay which has arisen under the present Administration? When is the National Gallery to be begun? There has been a competition of able men, the architect has been selected and appointed, and a sum voted by Parliament upon his plans. Is this to be delayed till the "*Ides*"?

There are the Public Offices to be completed. The site has been cleared, the rubbish carted away, and the foundations laid in. When is the superstructure to be carried up? For the Law Courts there is the suitors' fund in Chancery lying idle, and not a penny need come out of the imperial exchequer. If the National Gallery were carried out, we should by donations double the number of pictures, — individuals only awaiting the time when there is space to hang up their contributions to present valuable works to the nation. For want of Public Offices, a vast amount is yearly paid for accommodation in most inconvenient private premises. Should we not then have equivalents for these outlays? And in the mean time the artisans are left to starve, and the butchers, bakers, and other trades connected with them made to suffer with them.

There is also another side of the question. The mechanics must do something to induce the Government to spend their money. They must consent to lower the late extravagant wages,—to be satisfied with 6d. an hour instead of 7d.; to feel that they act nobly in accommodating their expenditure to 30s. a week instead of 36s., rather than to be paupers and idle and dependent on charity. Materials are lower already from depression of trade, and if wages be likewise diminished, the Administration may be disposed to undertake remunerative works when they can be carried out at moderate cost. The greatest economists in Parliament do not desire cessation of work; only that what is necessary should not be done extravagantly, and the ratepayer then would pay his taxes cheerfully. Oh, sir, that our Ministry would act nobly up to the occasion, and not wait to be driven thereto by a starving industrious population.

T. L. D.

DEPRESSED STATE OF THE BUILDING TRADES.

I HAVE read with attention the letter signed "Builder's Foreman: a Mason." I know that what he states is true; but he raises an inquiry into a very difficult question: What is the cause of this depression, and its remedy? I venture to give my opinion on both, founded on the experience of half a century of active manhood, with a full knowledge of the particular incidents of the trades, to one of which he belongs. The active prosperity of the "Building Trade," for some years causing a very considerable rise in "building labour" generally, was, like the prosperity which brought on the climax, on "black Friday in 1866," artificially brought about by a reckless employment of a super-abundant supply of actual and spurious capital: the result was a collapse, reducing the price of every description of material, building materials especially, except "labour." Those who take on themselves to organise the labour market say that they can by combination protect labour from the adverse influence of this general fall in price; but every present experience satisfies me they cannot accomplish this. If labour were now "permitted" to take the best price it could get, employment would be largely increased, and the time would come when, from the increased demand for labour, the price would rise. Would your correspondent, who probably, as a good hand, has been receiving 7d. per hour for eight or ten hours a day, consent to work for 6d. per hour, or less, if he could not get that? Would many others do the same? If so, the low price of materials and the low price of labour would tempt capital back to the building trades; and, after experiencing the disagreeable, though wholesome truth, for a short time that "half a loaf is better than no bread," the whole loaf would return. This is what every other active industry is obliged to do, and, notwithstanding all the emigration schemes of sending out the brave and energetic, and keeping the pauper at home, what the "labour power" must come to,—viz., submit to the practical effects of causes which it cannot control.

SENEX.

THE QUADRANGLE OF THE ROYAL EXCHANGE.

SIR,—The propriety of the observations made by your correspondent, "A. P.," in your number of the 5th inst., with reference to the covering over the central court of the Royal Exchange with a glass roof, cannot be denied. The effect which would be produced by such a covering, would not, in my opinion, in any way destroy the beauty of the building. The amount of accommodation provided by it in wet and muggy weather to our great merchants and City traders would unquestionably be a wonderful gain, and the convenience of such a covering to the public in general could not fail to be valued and appreciated as it would deserve.

The advertising mania alluded to by your correspondent cannot be too much deprecated. Advertise, advertise,—advertisements and disfigurements, are the order of the day; and that a public building like a Royal Exchange should be allowed to be "distorted and vulgarised, as it is, with boards of a thousand colours," appears to me certainly most disgraceful to those who are in authority, and able to put it down; especially when there are great capabilities at hand by means of a little money to decorate and give the proper character to the interior of the building, which at present it stands so much in need of.

I am not a moneyed man, not even a small merchant, nor a City trader, but will gladly contribute my mite towards such a desirable work as that of covering over the central court of our "Royal Exchange" (though I may very seldom or never make use of it), if it be only for the sake of protecting her Majesty.

J. H. G.

COAL-CELLAR PLATES.

A FEW days since I observed an urchin treading a piece of leather on the iron plate over a coal-cellar; by pulling a string attached to his *sucker* he lifted the unsecured plate. I pressed my walking-stick on the edge of another plate, and it instantly turned over like a thing of life. I replaced it, and passed on my way wondering that these are not looked after; it is temptation to entry, and dangerous to pedestrians; many are worn smooth, and when covered with snow, are very slippery indeed. District inspectors might inspect them. If one of them performed the letter V on the pave, or dropped through on to the coals, it would probably lead to a public duty being performed promptly and energetically. The Board of Works ought to supply them with *suckers*; the police might be furnished with the same: they would then have the *pull* against many negligent householders, and *call them over the coals* for not looking after their plate.

R. T.

THE HEARTH IN OUR HOME.

A CORRESPONDENT writes:—

"Allow me a few words on the construction of the fire-hearth in the speculating-fields, or rather in the hundreds of small houses that have sprung up around the metropolis. I have made a point to notice this important fact, that the trimmer of flat brick, or no trimmer at all, is the rule, and the brick-on-edge trimmer is the exception; then comes plastering with layer of mortar; and then, to fill up, gravel and thinned mortar; finished with ½-inch of Portland cement. With the plastered ceiling all looks secure.

I have heard of two serious accidents from the failure of such hearths in these last few months. In the one case, at Peckham, a little child was nearly killed underneath, and a young woman nearly came through with the falling *débris*. In the other case, at Bow, an old gentleman, sitting by the fire, was severely lacerated. In both cases the affair seems to have been hushed up, or quietly settled.

It is almost time the public were protected from this penurious atrocity. I leave the case in your hands, to treat it as you may think fit in your journal."

The warning comes not a day too soon. The Building Act says,—"The hearth or slab of every chimney shall be bedded wholly on brick, stone, or other incombustible substance, and shall be solid for a thickness of *seven inches* at the least beneath the upper surface of such hearth." In some cases the joists are of such insufficient depth that carrying out the requirement of the Act would bring the underside of the hearth below the ceiling; and district surveyors are sometimes unwisely led, out of mercy to the builders, to allow the insufficiently-formed trimmer to pass. More often, however, they are imposed on by false statements. A builder who has put in a hearth not in accordance with the instructions of the Building Act would find himself in an awkward position should a fatal accident occur in consequence.

SEMPRINGHAM ABBEY CHURCH.

THIS interesting old church has been restored from its sadly dilapidated state, and re-opened for divine service. The old roof is replaced by a new one. Uniform seats with bench ends carved in accordance with the existing originals, have been substituted for the heterogeneous and unsightly pews. Tiles laid in patterns now occupy the places of the broken slabs and stable pitching. The north wall has been rebuilt from its foundations, and extended so as to occupy the site of the old north transept. The walls and piers and arches have been denuded of their various coloured washes, and the mural decorations have once more been brought to light. Three out of the four tower arches are now opened, and that on the south has had a new window inserted, which has been filled with stained glass, containing the sacred monogram and medallions with Alpha and Omega, the gift of Mrs. Saunders, the wife of the vicar. There is another window of stained glass on the south side of the nave, the gift of the Rev. J. C. K. Saunders and Mrs. Saunders, in memory of two daughters. The subject is Our Lord's Ascension, executed by Mr. W. H. Constable, of Cambridge. A third window represents the Saviour inviting the weary and the heavy laden to come to Him. The chancel has been re-built by the Crown (her Majesty being the improprietor and owner of half the parish), at the cost of 400*l*. It is in the Early English style, with an apsidal termination, having three lancet windows at the east end, between which are pilasters of red Mansfield stone, resting on carved corbels, and surmounted with sculptured capitals. The floor is laid with Minton's tiles. The pulpit is of carved oak, on a stone base.

OXFORD.

Proposed Enlargement of the City Court.—At a recent meeting of the town council, the City Buildings Committee reported that the following builders had been invited to send in tenders for the enlargement of the City Court, namely, Geo. Wyatt, Chas. Selby, Messrs. Honour & Castle, T. Jones, George Jones, James Baker, Henry Cowley, and J. R. Symm. When the tenders (five in number) were opened, Messrs. Honour & Castle's, amounting to the sum of 292*l*., being the lowest, was recommended to be accepted, and the town clerk to be instructed to draw up a contract and submit it for the approval of the committee. The mayor, in reply to a question, said five tenders were sent in as follows:—Mr. G. Jones, 352*l*.; Messrs. Honour & Castle, 292*l*.; Mr. J. Baker, 315*l*.; Mr. C. Selby, 358*l*.; Mr. T. Jones, 325*l*. Mr. Wyatt & Mr. Symm declined to tender. After a good deal of discussion the recommendation of the committee was finally adopted.

The City Gaol.—The City Gaol Committee recommended that Mr. John Castle complete the specifications in detail; also that he prepare the bills of quantities preparatory to obtaining tenders from builders, and that the estimate be divided in the following manner, namely,—1. A separate one for the new wing; 2. A sum for the alteration of the old building; and 3. An estimate from Messrs. Haden & Co. for the whole of the heating and ventilating. Mr. Galpin said there was a serious objection to one part of the report—that which recommended that the city surveyor should prepare quantities. There would be much dissatisfaction among the profession if such a course were adopted. Another reason for not adopting the recommendation was, that if any errors occurred in estimates of this description, prepared by the city surveyor, the authorities would be responsible. He agreed to the report with this exception, and he moved that the clause be expunged, and that the report be then approved. Mr. Bruton said he was bound, as an architect, to support Mr. Galpin's motion. There was no doubt he had stated what was the actual practice amongst the profession—that it was not politic for an architect or surveyor to take out quantities, or to be responsible for that part of the work. If that were done, the result would be, either that the builders would do just as much work as the quantities and ignore the specifications, or do the work in the specifications and not in the quantities, and that the city would be responsible for the difference. Mr. Collit was ultimately appointed; and the report was approved, with this exception.

The Sewage and Drainage.—The town clerk has issued a pamphlet bearing on these important questions. It is entitled "A Letter from the Town Clerk to the Mayor of Oxford on the Drainage Question and the Bill promoted by the Thames Conservancy." In his introductory observations he explains that he has received from the Thames Conservancy the duplicate of a letter addressed to the Board, repeating the previous injunction of the former body as to the discontinuance of the passage of sewage into the river, and stating that "The Conservators feel that immediate steps should now be taken to insure the purity of the waters of the Thames." The town clerk next sets forth the gist of the statutes prohibiting the pollution of that stream and its tributaries, and then goes at once into the subject of the sewage and drainage. In the outset he says,—

"If we are forced to some action, the general opinion seems to be that we must continue the present sewers,

now emptying themselves into the Thames and Cherwell, under the rivers and carry them on to the land, at some distance from inhabited houses, to be utilised on such land."

He proposes the utilisation of the sewage on successive meadows in the neighbourhood—

"And this," he continues, "brings us to the principal point in this paper, which is, that by the time the sewage water from Oxford found its way to the Thames, say at Culham Bridge, it would cease to be sewage, and it would be impossible for a chemist to detect the difference between the water in the river and that at the end of the sewage stream."

"The foregoing," the author adds, "was written several months ago, since which two important resolutions have been made: first, the Oxford Local Board, after several careful, deliberate, and temperate discussions, have determined not to purchase land, and in this I entirely agree; and secondly, a formidable meeting of landowners, convened by the Duke of Marlborough, have formed a committee to oppose a Bill promoted by the Thames Conservancy, and I submit that the gentlemen who have taken this view of the Bill have done so on erroneous grounds."

THE POETRY OF BUILDERS' BILLS.

IN a poem by Mr. F. B. Kitto, called the "Setting Sun," containing a large amount of autobiographical matter, the author gives the following oddly expressed musings on his builder's bills:—

"Midsummer day, is over past and gone,
And now the little bills come dropping in
In blank astonishment we view the totals:
O vanity of workmen's estimates
O danger of departing from our plans.
Alas these alterations and improvements
Have upset all our little calculations.
* * * * *
I may be angry and may make a splash
I cannot get away from these demands
Painters and glaziers, bricklayers, carpenters
Gravely maintain that every charge is right
With solemn faces they declare to me
The regular price is charged for everything.
No doubt they may be regular to them
But they are quite irregular to me.
Can I by County Court appeal oppose them
And shame these tradesmen into fairer charges?
I can appeal, but would that mend the matter?
I fear in that case I should fare still worse.
And have as well a lawyer's bill to pay.
The remedy is worse than the disease.
There are the bills: no doubt they must be paid
I'll pay the bills! and so have done with them."

PUBLIC-HOUSE BUILDERS.

SIR,—It appears to be settled that the Government intend to introduce the Bill, in this session of Parliament, for the purpose of making considerable alterations in the system of licensing public-houses; and as the new Beer Act of last session may be taken as an indication of the character of the proposed enactment, I think it is time that the builders on new estates in the suburban districts of London should be up and doing, and endeavour to get introduced into the new measure some special provision for the protection of their interests, otherwise the hardship inflicted last autumn licensing season, by the licensing justices refusing to grant any new beer licences whatever, and thereby rendering much expensive and valuable property completely unproductive and useless until they choose to grant spirit licences, may be perpetuated.

Builders should embrace the present opportunity, and use the powerful interest they undoubtedly possess, to endeavour to get their public-house property placed in a satisfactory position.

R. G. G.

GLAZING WALLS.

YOUR article in the *Builder* of February 5th, on "The Materials for Economic Dwelling-houses," contains some valuable suggestions. At the same time, allow me to say, that the plan you propose for glazing the surface of a wall with the aid of a salamander, or ironplate, is not very practicable, according to my opinion, for the following reasons:—First, because it would be a very difficult matter to lay the glaze on the wall with a brush, without disturbing the colours which would previously have been laid on the surface. And, secondly, because an iron plate would collapse before sufficient heat could be applied to fuse the glaze, that is to say, supposing your glaze was sufficiently hard to resist the weather. It would be all very well to cover the surface of a wall (externally) with a glaze such as is used on potteryware, and which would undoubtedly look brilliant at the time, but when the first severe frost came, it would assuredly fall off in thousands of small pieces. If you place a piece of potteryware, of any kind, out in the open air on a frosty night, you will find the next morning the glaze lifted in various places. Having said thus much in objection to your plan of glazing by means of a salamander, allow me to say that I think your suggestion of glazing external and internal surfaces to be highly valuable, if practicable. I would propose the following as being a feasible system of accomplishing the object in view. Build a wall of loose half-burnt bricks, in a shed at a brick-works, and then paint any pattern which may suggest itself, after which take down the wall, brick by brick, and dip them in a glaze sufficiently hard to resist any weather, and burn them in a muffled kiln; that is to say, a kiln with an inner case of very thin fire-clay, so that the heat could penetrate to melt the glaze without the flame and dust arising from the fires coming in contact with the bricks. My reason for mentioning half-burnt bricks here is that they would absorb the colours and glaze better than if well burnt, and they would become quite hard in the process of glazing. My opinion is (from some years' experience of glazing white enamelled bricks, &c.) that there could by this means be produced a thoroughly impervious wall, at a moderate cost, which would be highly decorative in its character, and which would beautify our street architecture to an extent at present undreamt of.

ALPHA.

SIR,—I have read with much interest the article on "The Materials for Economic Dwelling-houses," and I quite agree in thinking with you that the walls of cottages ought to be non-absorbent. I am at the present time manufacturing considerable quantities of glazed fire-bricks, which in my opinion answer the purpose. They are used largely for kitchens and outbuildings, so as to do away with papering or whitewashing. The cost is but trifling, and only the sides and edges are glazed; so that the tops and beds may adhere readily to the mortar, and there be nothing to interfere with its setting.

THOMAS H. SEACOME.

DRURY-LANE THEATRE.

AT the general meeting of proprietors held on Monday, a report from the architect of the theatre, Mr. M. Nelson, was read. It pointed out that covenants as to repairs remained unfulfilled, complained that the work, so far as it had been done, was unsatisfactory, and estimated the cost of the work remaining to be done at 2,250*l*. The chairman, in moving the adoption of the report, referred to the unusually crowded state of the room, and said it was probably owing to a difference which had arisen between the lessee and the architect. On two occasions Mr. Chatterton complained that the architect had been wanting in courtesy towards him, while, on the other hand, the architect complained that he had not been treated courteously by the lessee. Dr. Clarke said, considering how well and successfully the lessee had laboured for the good of the theatre, he thought he was entitled to every consideration at the hands of the committee, and that it should not be left to one person alone to say whether the repairs were properly done or not. The chairman said the lessee when he signed the lease, undertook to execute the covenants to the satisfaction of Mr. Nelson. Mr. Gruneisen complained of the censure implied in the architect's report upon the lessee, who, he contended, had been illiberally treated by the committee in refusing the extension of time he had applied for, and unfairly and arbitrarily by the architect, who sought to compel him to spend 4,735*l*. upon work which he could get as well done for 1,000*l*. less. The architect's specification was frivolous and vexatious, and it would be impossible to carry it out. He added that the dispute between the two gentlemen had been made the subject of legal proceedings. No action was taken by the meeting as to this matter. Mr. Chatterton has acted under the advice of Mr. A. Baker and others, and considers that he has properly repaired the theatre. We have received some curious statements on the subject, but do not think it necessary to publish them.

SOCIETY OF ENGINEERS.

AT a meeting of the Society of Engineers, held in the society's hall, Westminster Palace Hotel, on February 7, 1870, the report of the council and a statement of accounts and balance-sheet were submitted. The retiring president, Mr. F. W. Bryant, then presented the following premiums for papers read during the past year:—To Mr. E. G. Bartholomew, for his paper on electric telegraphy; to Mr. F. W. Hartley, for his paper upon the various methods employed in determing the commercial value and purity of coal gas; to Mr. Perry F. Nursey, for his paper upon English and Continental intercommunication; and to Mr. Vaughan Pendred, for his paper upon apparatus for measuring the speed of ships. The president for 1870, Mr. William Adams, then took the chair, and delivered an inaugural address, in which he reviewed at some length the various papers read during the past year. In concluding he said,—

"With reference to the position of our profession generally during the past twelve months it must be admitted that it has felt the effects of the commercial depression which has, more or less, for the past five years, influenced every department. But affairs appear to be changing in this respect, and the new year has opened with signs of returning animation. I hear on all sides of improving prospects, and of the development of practical schemes, which lead to the conclusion that better times are dawning upon us. In looking at the sources from whence we may expect work, Russia appears to be one of the most promising countries. A vast field is there open for enterprise, both with regard to mechanical and civil engineering, so that we may anticipate a considerable amount of work from that quarter. There are other directions in which we may likewise look for employment for our profession, but Russia, if I mistake not, will prove a great field for engineering operations. At any rate, be that field where it may, the future prospects of the profession are very much more encouraging than they were a year ago, so that we commence the present year with renewed hope."

THE COSTS OF ST. ANDREW'S CHURCH, HERTFORD.

A MEETING of the committee appointed for the erection of the new Church of St. Andrew, Hertford, has been held for the settlement of the costs of the edifice. Earl Cowper presided.

Mr. M. S. Longmore read a statement of sums received and paid by the treasurer, of which we give a summary. Received at the London and County Bank, 1,503*l*. 4s. 7d.; at Messrs. Sharples & Co.'s Bank, 1,577*l*. 12s.—Total, 3,080*l*. 16s. 7d. *Payments*—To Messrs. Dove & Brothers (the contractors), 2,350*l*. Other payments (including 189*l*. 8s. to the architect; 75*l*. 12s. to the Clerk of the Works; and 94*l*. 8s. for taking out quantities), 481*l*. 8s. 7d. Balance in hand, 249*l*. 8s. The amount of promised subscriptions remaining unpaid was 253*l*. 11s. 6d.

Mr. Johnson, the architect, presented a statement of the expenses incurred, from which it appeared that the charges on contract and for extra work, "ordered from time to time," were 3,734*l*. 15s. 5d.; Mr. Kiddill's (for heating apparatus), 80*l*.; and Mr. Schrivell's (for gasfittings), 60*l*., making 3,874*l*. 15s. 5d. To this must be added—architect's commission at 5 per cent., 193*l*. 14s. 9d.; for additional services rendered, 71*l*. 8s.; and for travelling expenses, 20*l*., making 285*l*. 12s. 9d. for the architect, and bringing up the total to 4,159*l*. 18s. 2d. Adding to this the sum of 75*l*. 12s. paid to the Clerk of Works, the gross total was brought to 4,235*l*. 10s. 2d. Of this sum, 2,831*l*. 8s. 7d. had been paid (as shown by treasurer's statement), leaving 1,404*l*. 1s. 7d. unpaid.

In answer to a question, Mr. Johnson stated that the amount of the builder's contract was 3,275*l*. There was an extra of 14*l*. 12s. for the foundation-stone, 182*l*. 5s. 8d. for additional foundations, and an extra sum for gas-piping and gas standards.

The extra items were gone over and mostly agreed to, and at the close of the meeting Earl Cowper complimented the architect on the way he had done his work.

THE PREVENTION OF ADULTERATION.

SIR,—I noted with some degree of consternation the paragraphs in your several issues relating to adulterated malt liquor, and also the theory of the effects of insanity attributable thereto. The question I would raise from these premises is, firstly, can we confine it to malt liquor, or are we not justified in laying the scourge of England—"brain diseases"—to the alarming adulteration of the whole food of the country? Scarcely an article comes to our table representing the commodity by which it is called, but is in some way or other severally adulterated, and must, I am confident, have an important influence on our physical career, and tend in some way to engender insanity, among other ailments. To this axiom I would therefore, secondly, ask, what is the remedy, and how to abate it? I am obliged to "W. T. S." for his suggestion of "withdrawing the licence" of licensed victuallers who are found transgressing their privilege, and think, were it enforced, every other public-house would be, happily for the community, closed.

But why, sir, could not licences be granted to every vendor of food in a similar manner, and part of the proceeds of the licence system be paid to medical officers of health in every town, borough, and county in the kingdom, who should be called upon to analyse any article a purchaser may reasonably suspect to be tampered with, and the penalty be commensurate with the fraud and injury inflicted by the ingredient used in adulteration. We see officers appointed to test our gas, and fine the company who poisons us with sulphuretted hydrogen and carbonic acid; we have the waters of the metropolis examined in a similar manner and reported on if free from organic matter; we have our sanitary arrangements attended to;

thus caring for our purity of air, fire, and water: then, why, I repeat, cannot such a scheme as I mention be promoted to prevent us being slowly poisoned by 99 per cent. of our articles of consumption? I am fully persuaded, if the legislature adopted such a plan we should hear of no more "bosch" for butter, no more diseased meat chemically rendered usable in sausages, no more mahogany sawdust in coffee, no more of the thousand things we innocently consume daily, to our physical derangement, and at the expense, perhaps, of our mental capacity.

W. L. G.

ARBITRATION AS TO GROUND AT CROYDON.

MR. UNDER-SHERIFF ABBOTT has held a court at the Greyhound Hotel, Croydon, before a special jury, to assess the amount of compensation to be paid by the London, Brighton, and South-Coast Railway Company, for lands required to be taken from the trustees of Ellis's estate, for the construction of the Surrey and Sussex Junction Line. Mr. Lloyd, for the claimants, having given a history of the Sussex and Surrey Junction Railway (now proposed to be abandoned), called Mr. Robert William Fuller, who deposed that he was an auctioneer and valuer, having considerable experience with regard to the value of property in and about Croydon. The quantity of land altogether taken by the company was 3a. 0r. 31p.; of this 2a. 2r. 15p. was building land, which he estimated to be worth 600*l.* an acre; detached residence, with garden and grounds (2r. 16p.), together with the reversion of 75*l.* per annum on the expiration of a lease in 1875, he had estimated to be worth, together, 1,358*l.*; add 10 per cent. for compulsory sale, 291*l.* 8s.; and 500*l.* for consequential damage and depreciation in value. The figures, as worked out, would be as follows:—

Freehold land, at 600*l.* per acre	£1,556	5	0
Detached residence, with garden, at 55*l.* per annum to end of lease, with subsequent reversion of 75*l.* per annum, including 5 per cent. interest	1,358	0	0
	£2,914	5	0
Add 10 per cent. for compulsory sale	291	8	0
Consequential damage	500	0	0
	£3,705	13	0

Mr. W. J. Blake, an auctioneer and valuer of thirty-five years' standing in Croydon, gave evidence as to the value of property in the neighbourhood, and the estimate he had made thereupon of the value of the plot in question, the total of which amounted to 3,674*l.* For the railway company, Mr. H. Jones, Mr. C. F. Adams, and Mr. F. Vigers, surveyors, estimated the value of the land at 2,453*l.* The jury awarded 3,100*l.* to the claimants.

COMPETITIONS.

Alexandria Fountain Competition, Glasgow.—In this competition, which is for a testimonial fountain to be erected in honour of Mr. Alexander Smollett, of Bonhill, a design by Messrs. Adamson & M'Leod, architects, under motto "Seven," has been selected by the committee from thirty-six sent in. The erection of the fountain is to be proceeded with at once. The style is French Gothic, to be carried out in durable freestone and red and gray granite.

Kensington Workhouse.—The Board of Guardians met on Wednesday, the 9th inst., when they selected the design submitted in competition by Mr. Williams.

CHURCH ARCHITECTURE OF THE NINETEENTH CENTURY.

SIR,—No century since the Reformation has seen so many churches built as the present, but as we are living in practical, businesslike, and, we may hope, useful times, why should not the plan of our new churches be in accordance with our present form of worship, instead of being built after the pre-Reformation type of parish church? We meet for worship as one congregation, but generally under four separate roofs, viz., nave, two aisles, and chancel; sometimes, perhaps, only one aisle, and in very small churches with perhaps only nave and chancel; but what would be thought of our architects if they were to build any other kind of building that was intended for one assembly, "say a music-hall," with even one row of pillars down the length of it? Now, perhaps, my argument may be met by the difficulty of the wide span of roof in Gothic architecture, but this is not an insuperable difficulty. Take Westminster Hall and King's College Chapel for instance; besides, the later Gothic has wider and less pointed roofs than the Early Pointed, which our architects are so fond of copying. Moreover, Gothic is not absolutely necessary at all, though usual, and perhaps desirable.

Since our railway stations have become common, we have many specimens of wide-spanning wooden and iron roofs of light and somewhat elegant appearance; and looking at it as a matter of expense, though the roof would probably be more, the stone or brick work and foundations would probably be less. Now, perhaps, some of our Churchmen may think it unorthodox not to have a chancel, but this may be obviated by having it all chancel, having the seats each side, and facing one another, like our cathedral choirs and college chapels, or there might be some artificial division if desirable; but if we must have a chancel under a separate roof, let it be of the same width as the church, that the whole congregation may see and hear the clergyman when at the communion-table; for under the present system those in the aisles, "which form nearly half the entire congregation," have often some difficulty in doing this. As a matter of usefulness, we might take example from Dissenting chapels, however incongruous some of their Gothic-Grecian fronts may appear.

I am aware that some of our modern churches have aisles to the chancel, and perhaps some may consider these our models; but this is only dividing them into six compartments instead of four, and increasing the number of pillars, and still a great number in the aisles are unable to see the clergyman at the communion-table or pulpit, or when he is in any other position.

J. H. G.

CHURCH-BUILDING NEWS.

Carlisle.—The new parish church of St. Mary Within has been opened. The site is in the Abbey, near the cathedral. The new edifice has been built of red freestone in the Gothic style of architecture, the great object of the designer having evidently been to make it as simple as possible, but at the same time to make it harmonise with the cathedral. The interior differs from that of the other churches which have recently been built in Carlisle, inasmuch as it has no chancel arch to divide the chancel from the nave. The entire length of the church from the west end to the chancel step is 59 ft., and thence to the extremity of the apse it is 36 ft. more. The width of the nave between the pilars is 33 ft., and that is also the height of the side walls, while the height to the ridge is 64 ft. There are two aisles, each 12 ft. wide, divided from the nave by three arches on each side, turned with red and white stone alternately, and resting upon pillars of Kilkenny marble. The clearstory is lighted with sixteen lights, each about 7 ft. in height, arranged in mullioned windows in doublets, relieved by shafts of Irish green marble supporting the arches. At the west end there is a four-light window, 13 ft. wide by 24 ft. high, filled with tracery in geometric Gothic design. There is a small tracery window at the end of each aisle, and the aisles are further lighted by small plain windows. The apse is semicircular in form, and in it are seven windows with tracery heads, the finishing of the interior being shafts of Irish green marble. The reredos is done with Minton's encaustic tiles, chocolate and red tiles being placed alternately, and relieved by bands of green glazed tiles. The chief feature of the east end, however,—which, by the way, is, strictly speaking, the south-east, as the church, like the cathedral, does not stand directly east or west,—is the stained glass presented by Mr. Losh. The central lancet window contains the Ascension, and each of the six other lights contains two subjects, those on the left of the centre representing incidents from the Old Testament, chiefly illustrative of the life of Moses; while those on the right have for their subjects incidents in the life of Christ. The roof of the apse is hipped and ornamented with monograms and floral decorations. A noteworthy feature of the interior is its inner roof. Several feet underneath the timbers of the roof an inner ceiling of elliptic shape has been constructed, supported by Gothic ribs, and this is said to improve the acoustics of the church. The whole of the wood fittings are of Memel varnished. They are designed after the style of those in the Temple Church in London. Sittings are provided altogether for 593 persons. The chancel has encaustic tiles on the floor. Behind the pulpit, and adjoining the vestry, the organ, built by Messrs. Gray & Davidson, has been placed, at the cost of Mr. Losh; whilst in the opposite corner, seats are placed for the accommodation of Sunday-school children. The church is heated by Hayden's patent hot-air apparatus. There are ninety-four gas jets placed round the top of the reredos, and a row of twenty-four jets runs round the capital of each of the pillars of the nave. The total cost will be about 6,000*l.* The contractor for the whole work, at 4,828*l.*, was Mr. George Black, of Carlisle, joiner, who sublet the stonework to Messrs. C. & J. Armstrong, builders: the plumber was Mr. Richard Johnstone, of Carlisle; the slater, Mr. Norman; Messrs. Slee & Morgan were the glaziers for the contract work; and Mr. Thomas Corbett supplied the Anglesea and Irish green marble columns. Mr. Christian was the architect.

Books Received.

The Second Course of Orthographic Projection: being a Continuation of the New Method of Teaching the Science of Mechanical and Engineering Drawing; with some Practical Remarks on the Teeth of Wheels, the Projection of Shadows, Principles of Shading, and Drawing from Machinery. With numerous Illustrations. By WILLIAM BINNS, Assoc. Inst. C.E. London: E. & F. N. Spon, Charing-cross. 1869.

AFTER an interval of some years, Mr. Binns has supplemented his Elementary Treatise on Orthographic Projection with a second volume, in which he has compressed the pith of the lectures delivered by him at the late College for Civil Engineers, Putney, and at the Department of Science and Art, Kensington. In this second course of Orthographic Projection, he has propounded the importance of establishing a uniform system for the formation of the teeth of wheels, and having compared the various methods now in use, and slightly altered that which is considered the best among them, he hopes his improvement will be recognised and universally adopted, so that for the future there may be but one form. As matters now stand in this department of mechanical engineering, two wheels of any given pitch obtained from different makers will not work together, because every maker has a formula of his own for the shape of the teeth, which he believes to be the best, but which, as we have remarked, prevents his wheels from working with those obtained from any other firm. After describing the methods pursued by various engineers, including that obtained by the use of the odontograph, he lays down a plan, by the adoption of which the inconveniences attending the present diversity of rules might be done away with. He proposes,—

"1. That there shall be a generating circle for every pitch, and that the pitch be stamped or otherwise marked on each 'scriber,' or generating circle.

2. That the diameter of each generating circle be equal to the radius of the least wheel of the set.

3. That the number of teeth assigned to the least wheel be fourteen for all sets of wheels for mill gearing."

The proposal of a universal epicycloidal system has been made before now, but from the fact of a want of sufficiently definite terms it fell to the ground. The diameter of the scriber, for instance, was left to the judgment of each maker. Mr. Binns's more precisely stated proposal is likely to be useful. French and American engineering has been laid under tribute by the author, and he incidentally mentions facts that may be serviceable. In describing bearings for shafts, we may note, he says, an alloy of copper and tin is the composition most in use, though compounds of tin and zinc, with a little copper, have been employed, as well as pure tin; but this last has the disadvantage of flattening out under pressure, unless confined by a flange or ledge of harder metal, in a manner patented in 1843, from an American plan, communicated by Mr. Babbitt, of New York. Again, he records that Mr. Penn has employed lignum-vitæ for the bearings of screw propellers, with a plentiful lubrication of cold water, with very satisfactory results; and similar scraps of information are frequently dropped by the way. The chief contents of this second course, however, consist of instruction in such matters as toothed wheels and their pitch, spur wheels and their delineation, mortise and other wheels; the cycloid, epicycloid, hypocycloid, and involute; spur, bevel, skew, and other gearing; eccentrics, weigh shafts, cams, heart-wheels, wipers, tappets, and ratchet-wheels; couplings, plummer-blocks, pulleys; and similar details, without a knowledge of which all the art of the engineer would be as nought. When these are fully explained and described, the projections of shadows are treated at length and with luminosity; and then the work concludes with two chapters, with which it might as well have been commenced; the first being on shading and colours, and the second containing directions how to draw from the machine and copy drawings. To those in want of plain instructions on orthographic projection, we commend the work, generally. The author, we perceive, particularly recommends to pattern-makers the section of it we first mentioned.

First Teachings about the Earth; its Lands and Waters; its Countries and States: a Beginning for Children. By M. OGLE. London: Simpkin, Marshall, & Co. Dorking: Clark.

THE useful lady who is the author of this volume says, with much truth, in her brief preface:—

"The child to whom that weary collection of names and sounds in ordinary political geography is distasteful and meaningless, becomes at once interested and pleased when taught about the earth as a whole; as a planet spinning on its axis, with its bulging tide-waves, its fire-spitting craters, its blue atmosphere, its cloud vapours, its mountain chains, and its coral islands."

Then it is that the child becomes interested in the earth and its people, its nations, its capitals, and towns, and its political histories; and so prepared for that dry political geography with which children are usually forced to begin, whether they like it or are interested in it or not.

It is well such a volume as this should not only be simple and clear, and it is so; but there should be no obscurity such as this, for example:—"Tulip trees—trees which produce the red dye, 'cochineal.'" As most people know, cochineal is an insect, and not an exudation, or an extract, from a tree, as this quotation might lead children to suppose.

In general, however, the matter is both accurate and simple. It is divided into lessons, and to each lesson is appended a list of questions, with the answers briefly stated.

VARIORUM.

MR. TIMBS'S Year Book of Facts in Science and Art, which we always look through with special interest, has been issued for the past year. The portrait on this occasion is one of Mr. Reed, C.B., the chief constructor of the navy, and, as usual, there is a memoir along with the portrait. The volume contains the usual amount of varied information as a yearly record of progress in discovery and of improvements in science and art.

Miscellanea.

Complaints of Scarcity of Employment come from the Northern United States, where there is "a glut in the labour market." It is said there are at least 50,000 workmen in New York out of employment; and the *Chicago Tribune* calculates that there are at any rate from 15,000 to 20,000 in the same condition in that great hive of the West. The same thing is said to be true of all the towns and many of the rural districts all along the Northern States. A correspondent of the *New York Tribune* represents that there are in the rural districts of New York State alone at least 100,000 persons unemployed. That journal advises that they should go to the far West; but the *Chicago Tribune* points to the South as the great outlet for surplus labour. The *Toronto Globe*, recommending the North, says that the present condition of the farming population, even of the Western (United) States, is far from being what could be desired, but that there never was in Ontario a better prospect of ample employment than in the coming spring and summer, though the supply of work is comparatively limited at the present time; and the *Star*, speaking of the workwomen, give painful instances of the hardships caused by scarcity of employment, or inadequate wages, amongst women.

The Cost of the Leavesden and Caterham Asylums.—At a recent meeting of the Metropolitan Asylum District Board, a letter was read from the Poor Law Board, which, referring to a previous letter of the manager, said the Board could not "share the satisfaction" of the managers with regard to the near completion of the Leavesden and Caterham Asylums, inasmuch as the original estimates had been exceeded by nearly 6 per cent. A resolution was passed reminding the Poor Law Board that the original estimates were only approximate, and that there was cause for satisfaction to the managers when they found that their rough estimate of 257,000*l.* for the two asylums, and all connected with them, would only be exceeded by 15,000*l.*, the actual cost being 272,000*l.*; and they held that there were very few, if any, instances of buildings of a similar magnitude being completed for a sum so closely approaching the original estimates.

The Hornsey Drainage.—At a special meeting convened to consider the schemes submitted for draining the Hornsey and Crouch End district, Col. Jeakes, the chairman, stated that three engineers of eminence had been consulted, each of whom was capable of carrying out the plan he submitted. The plans were almost identical, the difference being, that Mr. Latham would allow storm-water to flow with the sewage, whilst the others would provide a separate set of drains. He thought they should judge each plan irrespective of land for irrigation, as it was possible that some chemical process might be devised for the purification of the sewage, whereby they would be relieved from the expense of purchasing land. Mr. Latham's estimate was 28,350*l.*, irrespective of compensation; Mr. Meason's, 43,427*l.*; and Mr. Shield's, including compensation (17,000*l.*), 44,236*l.* Their surveyor had taken out the quantities, and calculated Mr. Latham's at 47,044*l.*; Mr. Meason's, at 46,056*l.*; and Mr. Shield's, at 53,383*l.* In Mr. Latham's plan it was proposed to drain Stroud Green by a sewer, 42 ft. deep, for two miles; and in Mr. Meason's there was to be an embankment to carry the sewer through the Campsbourne estate. A discussion ensued, and it was finally agreed, that from the knowledge their surveyor had of the district, he should draw up a report for the guidance of the Board.

The British Archæological Society of Rome.—This society has begun the season with vigour. The weekly meetings are well attended. Last week the excursion was to the tombs on the Latin Way and the remains of the Church of St. Stephen. The frescoes and stucco ornaments of the first century in the tombs were much admired, and the remains of the early church were considered interesting; but great surprise was expressed that a society of gentlemen or ladies should be obliged to creep through a hole to see them, merely because the authorities have walled up the doorway in the modern walls built by the Pope to perserve the ruins. On the 22nd of January, the excursion was to the Thermæ of Caracalla, where Mr. Wood, the secretary, repeated on the spot Visconti's lecture, which he had read the night before at the meeting. The society then went to see the subterranean chambers, to which the entrance is from an adjoining vineyard behind the Thermæ—the proprietor of which was very obliging, and ready to show anything. There is no plan to be had of these interesting sub-structures. One corridor runs the whole length of the Thermæ, and is probably 10 or 12 yards high, but it is so much filled up with earth that the bottom has not yet been reached.

Improved Industrial Dwellings Company.—A meeting of the shareholders of this company was held at the Mansion House on Monday. The report, which recommended a dividend at the rate of 5 per cent., leaving 2,284*l.* to be carried forward, was taken as read. The chairman, Sir S. Waterlow, in moving that it be received and adopted, said that the amount received from the tenants in the shape of rent was very satisfactory, considering the great depression of trade. He had no doubt still more satisfactory results would be shown if trade revived. The shareholders had not gone into the matter with the view of making large profits; their object, rather, was to ascertain whether the dwellings of the working-classes in the metropolis could be reconstructed on a plan which would yield a fair and reasonable return on the capital invested. The working of this company showed that that could be done, and Mr. Allan, who had erected most of their dwellings, was so satisfied of their progress that he had undertaken a similar work on his own account as a building speculation. He had already erected one block of buildings, and had commenced the erection of other four blocks. The report was unanimously adopted.

The Brighton Sanitary Association.—The annual meeting of this Association has been held in the Committee-room at the Royal Pavilion. The committee's tenth annual report stated that much useful work had been effected during the year. The agents of the society had diligently exerted themselves in the discharge of their respective duties; and it was evident that, through their influence, a great improvement was manifested in the general cleanliness of the houses, as well as in the occupiers of them, in the districts which have come under their inspection.

The South Staffordshire Industrial and Fine Arts Exhibition.—At the concluding meeting of the committee who successfully carried out this exhibition held in Wolverhampton last summer, the statement of accounts was presented, the surplus appropriated, and the committee dissolved upon the termination of their labours. The net profit is 875*l.* The exhibition was visited by nearly a quarter of a million of people, and of these at least 75,000 were working men. A scheme was laid before the meeting for spending the balance, and securing 1,000*l.* of Government money to establish a central art and science school for Wolverhampton and the district. The exhibition was projected for the equal benefit of the Wolverhampton School of Art and the South Staffordshire Educational Association; and at the meeting Mr. Rupert Kettle explained the outline of a plan in which the two institutions propose to co-operate for the accomplishment of this object. It is essential for the success of the proposal that about 700*l.* should be subscribed by the public, and an appeal is to be made, under the sanction of the Exhibition Committee, to the guarantors of the exhibition, and the manufacturers, merchants, and others, for this sum, which is considered sufficient to found a self-supporting school to diffuse a knowledge of art and of science in two important branches, in this populous locality.

Lecture on Puttenham.—The Rev. Charles Kerry, curate of the parish, has read an interesting paper, in the school-room, on "The History and Antiquities of Puttenham." The rector, the Rev. W. A. Duckworth, took the chair. The room was densely crowded, and the audience were much interested and gratified with the essay, which was illustrated throughout with humorous stories of the sayings and doings of the old folks of Puttenham. The lecturer exhibited the British and Roman relics discovered in the parish within the last few months, whilst other interesting objects less portable were illustrated by large ink drawings, which added to the general interest. The address contained much of value and importance in connexion with Surrey archæology. The lecturer thus spoke of the name Puttenham. The word is Anglo-Saxon, and signifies the "Home of Pits." "Patten," or "pitten," is descriptive of the home, and refers to some kind of home which appeared at least remarkable to the Saxons. It is well known that the Britons usually scooped pits in the grounds for their habitations, roofing them with a conical erection of branches or reeds.

Reduced Postage for Printed Matter.—Printed matter abroad is carried at much lower rates than in this country, to the great benefit of the community. Circulars, newspapers, and books, and even small parcels, are transmitted by the post in foreign countries at rates which should put Englishmen to shame. The Government, last Session, expressed itself favourable to a reduction of the rates, and the Post-office officials, it is well known, are quite ready to undertake the service. In the multitude of other pressing duties it may be overlooked, and the council of the Society of Arts of London have therefore appointed a committee to take steps for urging upon the Cabinet the great importance to all classes of reducing the postage on printed matter to one halfpenny instead of a penny, as at present, for every four ounces weight. All classes should give their support and influence on behalf of this committee.

Music.—On Wednesday, at the hospitable residence of Mr. Henry Hill, F.S.A., a cantata, called "The Silver Wedding," the words selected and the music composed by Mr. William Lauber, was performed for the first time by a number of zealous and well-trained amateurs. It is a bright and sparkling work, and should obtain for the composer more attention from the music publishers than he, although by no means unknown, has yet received. The opening chorus, "Hail, happy day, with three-fold blessing crowned," the ballad, "The Sun in his glory and splendour," and the part-song, "May guardian saints your path attend," especially pleased the audience. The last-named is worth the attention of Mr. Henry Leslie for his choir. Pope, Goldsmith, Mathew Bishop, and others, supply charming words.

Buckingham Palace.—A number of workmen are engaged at Buckingham Palace in painting and decorating the interior. The decorations and improvements will cost about 6,000*l.*

Sale of the Demidoff Art Gallery.—The most magnificent private gallery of works of art in Europe is about to come to the hammer, and is expected to realise more than half a million of money. The Demidoff Gallery, in the Villa of San Donato, at Florence, has been stripped of its treasures, which are to be sold in Paris during the present month and the next. The walls left vacant, however, are again covered with pictures, which had been hidden away in the lumber-rooms of the palace. This splendid collection is rich in modern as well as in ancient masterpieces, of the Italian, Spanish, Flemish, and German schools. There are also marbles, porcelain, enamels, ivories, bronzes, jewelry, arms, tapestry, and indeed works of art of every description. The first day of the sale is the 21st of the present month.

The Sanitary Movement in Turkey.—A sanitary reform of great importance to every town in the Turkish empire has just been decreed. A Hygienic Council, attached to the Turkish Ministry of the Interior, has been created, with the function of improving the drainage, enforcing proper street scavengering, and generally applying measures for the advancement of public cleanliness both in the capital and throughout the provinces. Its further duty will be to improve existing civilian hospitals and establish new ones where needed. The president, vice-president, and secretary of the new board will be regularly salaried, but its members will only receive an attendance fee of a lira each sitting.

Another New Dye.—The aniline dyes, it seems, have now a rival which not only vies with them in brilliancy and variety, but is of a less fleeting or more fixing character. The new colouring matter, according to the *Mechanics' Magazine*, is a purely vegetable extract, the plant from which it is obtained being imported from the western parts of Africa, and also from the West Indies. The colouring matter is variously treated, according to the colours required and the dyes to be prepared from it. The process of production is carried on with machinery of a special character, which has been designed by the patentees, Messrs. Walker & Co., for this manufacture.

Gateshead New Town-hall.—At the last meeting of the Town-hall Committee Mr. Muschamp moved, "That the best thanks of the council be given to Mr. Johnstone, the architect, and to Mr. Bulman, the contractor, for the highly satisfactory way in which they have carried out their contracts." Ald. Bigger seconded the motion. The Mayor said there could only be one opinion about the resolution, for it was somewhat strange to hear tell of a building costing 12,000*l.* completed without one shilling for extras. The motion was carried, and Mr. Johnstone, the architect, being present, the Mayor tendered him the thanks of the council for the ability he had displayed.

Music in Cathedrals.—At the last meeting of the Worcester Cathedral Restoration Committee, the remarkable offer was made by the Earl Dudley to give 10,000*l.* for completing the restoration of the choir of Worcester Cathedral, at present suspended for want of funds, upon condition that the cathedral should be used exclusively for the celebration of religious worship, and that it should not be used for the musical festivals of the "three choirs." Of course the matter rests in the hands of the Dean and Chapter. The answer is to be given in April.

Waterworks, &c., for Baden.—In order to provide Baden, in Suabia, with a sufficient fund to carry out improvements when it has been deprived of one of the chief sources of its revenue, the gaming tables, which are to be suppressed in 1872, the rent paid by the proprietor of the tables has been raised, for 1871 and 1872, from 300,000 florins a year to 500,000 florins. Besides this, he has undertaken to expend 200,000 florins in the two years on improvements, such as waterworks and the construction of hothouses.

The Oxford Slade Professor of Fine Arts. Mr. Ruskin delivered his inaugural lecture in the Sheldonian Theatre on the 8th, when the edifice was filled with a large audience. The special subjects of the several lectures of the professor will be:—(1) February 15th, "The Relation of Art to Religion;" (2) February 22nd, "The Relation of Art to Morals;" (3) March 1st, "The Relation of Art to Use;" (4) March 8th, "Line;" (5) March 15th, "Light;" (6) March 22nd, "Colour."

Brentwood.—The chapel in High-street, which will shortly, we understand, be pulled down, appears to have formerly received a considerable amount of attention in respect to its internal embellishment. Several gentlemen were viewing the interior of the building, when one of them accidentally discovered a painting. It is situated on the wall close to one of the windows, and upon further removing the plaster by which it was covered, the nearly complete figure of an archbishop, wearing his mitre, was brought to light. Looking at the period at which the chapel was built, and the fact of its being dedicated to Sir Thomas à-Becket, it is thought probable that this is a representation of him, and that it was executed several hundred years ago. Further, but less interesting, paintings have been discovered contiguous to this.

Northern Architectural Students' Society.—The usual fortnightly meeting was held on Wednesday, the 2nd inst., in the Literary and Philosophical Society's committee-room, Newcastle, the use of which for the purposes of meeting has been granted to the students. The hon. sec. (Mr. Joseph Oswald) read the minutes of the preceding meeting, from which it appeared that a motion to amalgamate with the Northern Architectural Association had been rejected. Mr. W. Bedlington then read a paper upon "Landscape Gardening," which formed the theme of a discussion, in which many of the members took part.

Fir from British America.—We have received from Mr. A. E. Roberts, of Rood-lane, some specimens of stained and polished fir, imported from the north-west coast of America. The wood has a very fine vein, is suitable for cabinet-work, is of unusually large dimensions, and free from knots. The usual weight of the wood is about 37½ lb. per cubic foot, and when artificially dried by the desiccating process, about 34½ lb. The unstained specimens are particularly beautiful.

Bequest to a Town.—The Chevalier de Strassern, who recently died at Baden, in Austria, has left to that town his fortune, which consists of a sum of 210,000 florins (2 fr. 50 c. each), and a splendid residence surrounded with an immense park. The only condition he imposes is that the capital of the money shall remain intact, and that the interest shall be employed for ever in the embellishments of the locality.

Timber Measure.—At a meeting of persons connected with the timber trade of Liverpool, held on Monday—Mr. E. Chaloner in the chair—it was resolved to resist to the utmost the substitution of calliper or any foreign or invoice measure, or of any other measure, in lieu of that known as the "sale measure of the port." There was a large attendance; and only one gentleman dissented from the resolution.

Bristol Cathedral.—The present Mayor of Bristol has offered to build (at his own cost) the north porch designed for the new nave by Mr. Street. This donation (equivalent, it is thought, to 1,200*l.*) is made to depend on the condition that 600*l.* be at once raised in special donations (without trespassing on the general fund) to carry on the north wall of the nave to meet the porch.

Temperature of the Earth.—In a paper read before the Royal Society Mr. Hull records the temperature of the strata through which the shaft of a coal-mine was sunk near Wigan. It is nearly half a mile deep, and penetrates the globe farther than any other mine. The temperature of the coal at the bottom of the mine, as stated in Mr. Hull's paper, is ninety-three degrees and a half!

Schools at Middlesbrough.—The new British schools erected at Middlesbrough, at the sole cost of Mr. Joseph Pease, of Darlington, were formally presented to the trustees, on behalf of the town, by Mrs. J. W. Pease, last week. The new buildings, which have cost 4,500*l.*, will accommodate 700 scholars.

London and Middlesex Archæological Society.—The ordinary evening meeting will be held on Monday next, at University College, Gower-street, when a paper will be read by Mr. J. G. Nichols, entitled, "Sir William Harper, Mayor, 1561."

Progress of Steam in Agriculture.—A steam plough company is to be started for the county of Northumberland. Upwards of 1,500*l.* have already been subscribed.

On Local Taxation.—The Local Taxation Committee, of which Sir Massey Lopes, bart., M.P., is chairman, have awarded the prize of 50*l.*, which they offered for the best essay on the present system of local taxation, to Mr. C. F. Gardner, B.A., of Devonport.

Fall of a Chapel Wall.—A portion of the front wall of the new chapel in course of erection on the site of the old Mount Tabor New Connexion Chapel at Fenton has fallen. Fortunately, no one was near enough at the time to be injured by the bricks which fell. The damage is said to have been about 50*l.*

The Law Courts.—Workmen have commenced the demolition of several houses in Fleet-street, the ground on which they are built being required, we may suppose, for the new law courts.

Wem Church.—Wem Parish Church has just been heated with a hot-water apparatus by Messrs. Evans & Morris, of Shrewsbury, at a cost of 125*l.* The length of the church is 72 ft., width 45 ft., and height 26 ft.

TENDERS.

For two houses, with stable, &c., Sherwood-street, Nottingham, for Mr. J. S. Butler. Mr. John Collyer, architect. Quantities supplied:—

Nickers	£997 0 0
Johnson	889 10 0
Slim	881 0 0
Bown	870 0 0
Sedgwick	830 0 0
Bell & Son	829 0 0
Messom	828 0 0
Wool & Slight	818 0 0
Jelly	817 0 0
Attenborrow	804 0 0
Wheatcroft	799 0 0
Andrews	785 0 0
Rushworth	764 0 0
Shepperson (accepted)	759 0 0

For the erection of dormitories, &c., at Leytonstone, for the Guardians of St. Matthew, Bethnal-green. Mr. W. Mundy, architect. Quantities supplied:—

Whitford & Co.	£2,930 0 0
Marr	2,823 0 0
Crockett	2,800 0 0
King & Sons	2,789 0 0
Holmes	2,782 0 0
Lee & Co.	2,750 0 0
Braby & Co.	2,647 0 0
Morewood	2,605 0 0
Capps & Ritso	2,562 0 0
Kent	1,856 0 0

For rebuilding two houses, Church-street, Greenwich, for Mr. Samuel Shove:—

Hunt & Son	£830 0 0 !
Neal	787 15 0
Beckett	697 0 0
Batley	682 0 0
Baughan	620 0 0
Blake	595 0 0
Jackson	595 0 0
Harrison & Edwards	587 0 0
Warr	575 0 0
Stenteford	565 0 0
Lambey & Co.	565 0 0
George	559 0 0
Banks	475 0 0
Shirley & Horn	468 0 0
Munday	460 0 0
Davis	446 0 0 !

For paving and fencing pathways of Waltham Holy Cross Parish Churchyard. Mr. Charles Chapman, architect:—

Cole	£452 10 0
L. Lee	380 10 0
Smart	345 12 0
Hanchret	345 5 0
Gardner	334 10 0
Bird	329 0 0
W. Lee	326 0 0
Rutty	290 0 0
Turner	290 0 0
Patman	273 0 0
Bentley (accepted)	272 10 0

For taking down old buildings and building four houses at Leatherhead. Mr. Dibble, architect:—

Walker	£1,905 9 0
Putney	1,589 2 0
Hamblin	1,420 0 0

For taking down and rebuilding house and shop, &c., South-street, Dorking, for Mr. Randall. Mr. Dibble, architect:—

	House and Shop.	Warehouse.
Putney	£698 0 0 ...	—
Johnson	498 15 0 ...	£61 13 0
Taylor & Clear	470 0 0 ...	53 0 0
Lynn & Dudley	465 0 0 ...	49 0 0
Hamblin	430 0 0 ...	46 0 0

For new infirmary and casual wards, to be erected at the union workhouse, Richmond, Surrey. Messrs. Brewer & Son, architects:—

Long	£3,697 0 0
Gammon	3,597 0 0
Sims	3,250 0 0
Sale	3,237 0 0
Sweet	3,200 0 0
Gascoynes	3,190 0 0
Avis	3,148 0 0
Adamson & Sons	3,095 0 0
Dove	3,075 0 0
Carless	3,051 0 0
Manley & Co.	2,956 0 0
Wigmore (accepted)	2,750 0 0

For detached residence, No. 2 on the Yew Bank Estate, Kenley, Surrey. Mr. Charles Rutley, architect. Quantities supplied by Messrs. H. Blackwell & F. Rutley :—

	Residence.	Suffolk Facings Extra.
Parker	£1,824 0 0	£20 0 0
Woodward	1,764 0 0	18 0 0
Snowden	1,757 0 0	52 0 0
Wright, Bros.	1,750 0 0	35 0 0
Peskett & Taylor	1,745 0 0	40 0 0
Garrett	1,676 0 0	36 0 0
Garrud	1,630 0 0	15 0 0
Hearle	1,613 0 0	30 0 0
Hunt	1,559 0 0	30 0 0

For erecting two cottages at Wimbledon, for the Right Hon. the Earl Spencer. Messrs. Beeston, Son, & Brereton, architects :—

Parsons & Co.	£1,183 0 0
Bracher & Son	1,125 0 0
Easton Brothers	1,074 0 0
Adamson & Sons	997 0 0
Wigmore	980 0 0
Avis & Co.	939 0 0

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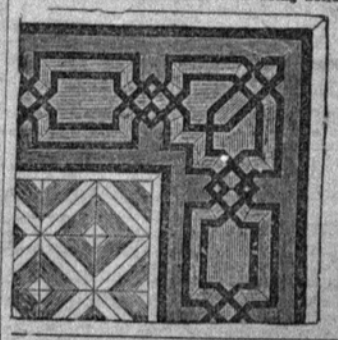

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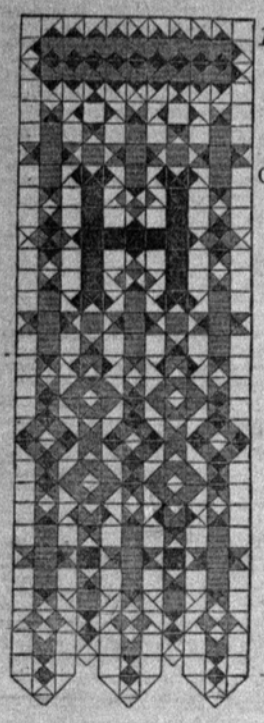


Incomplete Decorations at the Palace of Westminster.

HORACE never was in London. That fact may be stated without fear of contradiction. The sparkle of his inimitable verse was never dulled by the fogs of the Thames. Its glow was never checked by the vigour of an English writer. Coracles lay on the banks now covered by palace and by hospital, when the Roman satirist was polishing his epistle *ad Pisones*, or leisurely pursuing that famous journey to Brundusium over a route to be taken eighteen centuries later by the Indian Mail.

But though Horace had not the advantage of being able to express his opinion as to English taste and English manners, no words could more happily express the verdict of the small knot of people who, some few days ago, met in the octagonal hall of the Westminster Palace, to enjoy a private view of the Venetian enamel mosaic decorations, than those of the Roman satirist. The large panel, representing St. George, was veiled until the arrival of the First Commissioner, so that time was given to compare, or rather to contrast, the gorgeous colouring of the vaulted and groined roof, rich in armorial bearings, and bright with gold, with the poverty-stricken baldness of the lower part of the hall.

> "Turpiter atrum
> Desinat in piscem mulier formosa supernè;
> Spectatum admissi risum teneatis, amici?"

In fact, the Central Hall, in its present state, is entirely beyond the range of criticism. It is only by chance that the subject is properly presented to the mind. So ridiculous is the contrast between walls and roof that no spectator would imagine that the hall was supposed to be finished. The bare, light-coloured stone below and the glowing colours above, lead to the natural conclusion that the apartment is in the possession of the workmen; and the activity of several of those functionaries, who were engaged in operating on the floor and in *washing the frescoes* of the adjoining corridors, strengthened the illusion. We may as well observe in passing that the latter process is, so far as our experience goes, quite novel, as applied to this description of work. Our climate has had enough blame thrown upon it for rendering *fresco* impossible, and many of the grimy and rueful faces that glare on us from the walls of Westminster give evidence that—be it the fault of climate, of artist, or of material employed—it is a gross misnomer to call those handiworks *fresco* paintings. Still, the scrubbing-brush—or, we believe, it was only a scrubbing flannel—was busily employed on that particular evening over the surface of these historic pieces; so that we were not surprised to see that a large piece of paint (plaster and all) had peeled off the nose of Charles, Prince of Wales, while his royal father, whom the prince is hugging on the occasion, is raising his hand to order his standard to be erected at Nottingham.

The decoration of the roof of the Central Hall, though betraying an inequality of surface, which the light of 104 gas-burners brought out in unnatural relief, is rich, picturesque, and quite appropriate to a state apartment. It has, besides, the important quality of durability, and, unlike *fresco*, it may be washed with impunity. Whether it be the best mode of decoration may admit of a question; but that it is good, and even excellent, there can be no denial. But such a roof, over an apartment walled with simple white stone, is a simple absurdity. Any but the most uneducated eye is shocked.

The intention of the original design, which was interfered with, as our readers may remember, by an unexpected vote of the House of Commons, was to produce a rich unity of decoration. The central shafts, at each angle, were to be gilded down to their bases. The parallel shafts on either side of these golden columns were to be of white marble. The intermediate mouldings were to be banded with red and light-coloured stone, and enriched with gilded roses. All this work is now in plain white stone. The gilding of the ribs of the roof is cut off at the capitals of the shafts, and the head of gold is placed on feet, and legs, and body of clay.

The windows in the Octagon bear marks of the constant warfare which the architect of the Palace has waged with light, or rather with darkness. The difficulty has been felt in this Central Hall (where it might have been thought almost impossible to occur) not less than in other parts of the building. To diminish it, the unfortunate expedient has been adopted of inserting a large quantity of clear, transparent glass in the windows.

The four spaces, or panels, which intervene between these windows, each above a door of the hall, it has been intended to fill with four pictures in mosaic work. One is now complete. It represents St. George, between two female figures, intended for Fortitude and Purity. On the whole, the work is not undeserving of admiration, both as to design and as to execution. St. George is attired in gilded and fluted armour, of a very late date, and a German pattern. He holds a sword of disproportionate dimensions, and has a wooden shield on his arm, the carved edge of which is represented with great truth and felicity. The figure of Fortitude, on the right of the saint, bearing a lance with a pennon displaying the red cross, is graceful and effective. The least successful part of the composition is the head of "Purity," which is cropped, low, and square, and very much resembles that of Vitellius, or some other of the more ignoble Roman emperors. Beneath the design itself (which seems to require rather more relief from shadow than has been given) are two escutcheons, one containing the three lions of England, and the other the cross of St. George. Between the two is a plaque, or square space, of gilding, inscribed, "St. George for England," the lustre of which, when seen from the opposite doorway, rather kills the rest of the composition. Seen, however, diagonally, the glare disappears. On the whole, the new specimen of mosaic is splendid and stately, in good keeping with the roof, although, for that very reason, in strong and damnatory contrast with the naked walls. The decorations were executed, we should add, from the designs of the architect, Mr. E. M. Barry.

Do not let our readers imagine that we have spoken with more emphasis than the case requires on the subject of the injury done to one of the most important apartments in the Palace of Westminster. The mode in which this great misfortune (for such it is) occurred must be fresh in the minds of those who take an interest in the subject. Mr. Layard was supposed—rightly or wrongly, it matters little—to have exceeded his authority in giving orders for the decoration of this hall. As a sort of practical hint, the estimates for the purpose were cut down by the House of Commons. Unluckily it was a case of cutting off one's nose to be revenged on one's face. The ex-Minister, in the occupation afforded by Spanish politics, may easily have forgotten the snub. But the fact that a national building has been injured for the sake of an implied "lesson" to a Commissioner of Works is written in plain and very ugly letters on the Octagon Hall. We can very ill afford to have such public proof set up of the ignorance and contempt of the very elementary principles of art which prevail among our representatives. At a time when the very life of English manufacture depends upon the spread of a competent art education among the industrial classes, the fact that the designs of an architect for one of our most conspicuous public places should be messed because the House of Commons was angry with one of the Ministry, can only be considered a national misfortune;—no, not only,—for we regard it also as a national disgrace.

There is another question connected with the decoration of the Palace of Westminster in which a very large number of our readers will be apt to take even a more lively interest than in the æsthetic harmony of the Central Hall; and that is the kind of decoration which should be employed in a national palace. In the Prince's Chamber there are illustrations of the Royal House of Tudor to the sixteenth century. It is very remarkable that these twenty-eight portraits, which have been so long in their present position as to trace their history to the personal impulse of the late Prince Consort, have received but little attention. Authorities on decoration seem ignorant of their existence, or, at all events, of their nature and origin. The darkness of the chamber they adorn, which is such as considerably to obscure their force and beauty, is probably one cause of this neglect. There exists an ably-written series of biographical sketches of the characters, drawn up by Mr. George Wallis, and illustrated by photographs of the portraits, but we believe that it is out of print.

These portraits, which fill panels about half way up the sides of the lofty walls of the Prince's Chamber, are painted on stout millboard, which had previously been saturated with oil, so as to be practically impervious to damp, the uncompromising foe and destroyer of the ancient leather hangings of the Middle Ages. The details of the ornamentation are incised in the surface of the panel, and the whole is then painted and gilded, the effect being as rich as that of enamel, though with less glitter and irregularity of reflection.

King Henry VII., the first monarch of the House of Tudor, is represented from Remée's copy of Holbein's picture, which was destroyed by the fire at Whitehall. He is a majestic and thoughtful figure, dressed in a richly furred robe, which has the peculiarity of two openings in each sleeve, or at all events of a slashed and furred division in the upper part, which seems to be intended to allow the occasional unembarrassed use of the arm. His consort, Elizabeth of York, is taken from the same authority, and wears a hood that resembles an architectural canopy. The two sons and two daughters of this royal pair, Prince Arthur, Henry VIII., Margaret, and Mary, with the ten consorts of this much marrying race of princes, follow. Of these, two are kings. Louis XII. of France (taken from a miniature in a missal), the first husband of Princess Mary, and *James IV. of Scotland*, the first husband of Princess Margaret, eldest daughter of King Henry VII., and Queen Elizabeth of York, the ancestor of the reigning family.

The three children of King Henry VIII., Edward VI., Mary, and Elizabeth, head the third generation of the Royal House of Tudor: the first is taken from a portrait by Holbein, at

Windsor, and the other two from three portraits by Lucas de Heere. With them ranks the husband of Queen Mary, the infamous Philip II. of Spain, the most bloodthirsty tyrant that has ever boasted of the name of Christian. The first cousins of these princes follow; Lady Frances Brandon, Marchioness of Dorset, daughter of Princess Mary and of Charles Brandon, Duke of Suffolk; and King James V. of Scotland, son of Princess Margaret. Mary of Lorraine, Duchess Dowager of Longueville, and second wife of King James V., is painted from a portrait in the possession of the Duke of Devonshire.

In the fourth generation ranks the romantic name of Lady Jane Grey, eldest daughter of Lady Frances Brandon, and the great-grand-daughter of King Henry VII., by his youngest daughter, Princess Mary, together with that of her second cousin, Mary Queen of Scots, daughter of King James V., and great-grand-daughter, of King Henry VII., by his eldest daughter, Princess Margaret. King Francis II. of France, firsthusband of the Queen of Scots; Henry Stuart Lord Darnley, her second husband and first cousin (being the grandson of Princess Margaret, by her second husband, Archibald Douglas, Earl of Angus); and Lord Guildford Dudley, the unfortunate husband of Lady Jane Grey, complete this interesting series of portraits.

Now we venture to express the opinion that a series of well-authenticated portraits of some of the most illustrious personages of English history, executed by English artists, and completed in a method perfectly suitable for mural architectural decoration, has a claim on the admiration of any man of taste (to say nothing of the patriot) as a fitting decoration for the palace of the nation. Of the long series of English sovereigns, the representatives and the allies of successive and rival dynasties, the knights and nobles of the stormy periods during which our institutions struck, like our native oak, their roots deeper into the soil, we have many portraits, coins, tombs, statues, and other memorials scattered over the country. The collection of these, or of well-designed copies of them, into a grand set of historical illustrations for the Palace of Westminster, would be a task of which the nation might well be proud. It would be the compilation of an illustrated history of England that would sink deep into the hearts of our children and our children's children. It would increase tenfold the value of each separate memorial by the co-ordination and the display of the whole.

In the Convent of the Superga, near Turin (that votive church of which the soaring dome commands a view of the plains of the Po, and even, on two or three days in the year, of the marble *duomo* of Milan), is a series of portraits of the Popes—from St. Peter to Pius IX. inclusive. We are not about to vouch for the authenticity of the portraits; and we regret to add that Italian justice or zeal has scratched out the eyes of the present pontiff. Still, with every allowance, the series is interesting and instructive.

Why should we, who have a history on which we think we are entitled to look back with so much more pride than any Italian even professes to entertain in referring to the long arrear of treachery, falsehood, griping avarice, and red-handed murder that attaches to the history of so many of the Popes,—we refer to no Protestant pleading, but to the pages of the Papal historians themselves,—why should we neglect the opportunity to form a national series of our own? Nothing sheds so much light on history as portraiture.

WESTMINSTER ABBEY.

The same fascination that compels people to revisit Westminster Abbey after they have once paced its hallowed precincts, appears to take firm hold of those who write about this deeply interesting edifice. If any one compiles a book about it, let him be a dignitary of the Church, an architect, a miscellaneous writer, or a collector of church notes, we may be sure of an appendix, or a supplement, or a second volume. Dean Stanley has shown that he has enjoyed no exception to this inevitability.* Scarcely have his Memorials of the Abbey been mastered by his public, than we find him in the grey aisles of the edifice taking account of things he missed in that work, or passed too slightingly over; or we see him standing by, as vault after vault is opened to verify or refute traditions of royal burials; or perusing documents pointed out to him, all too late, as yielding fresh facts. Knowing the working of the charm, we are not surprised, accordingly, to find he has now issued a supplement containing a few of his happiest after-thoughts, some elaborations of former statements, an account of the examinations of the royal vaults, some documents, a chronological table of events connected with the history of the Abbey, and twenty-three illustrations. The additions and corrections are made so that they may be read with interest and understanding, without constant reference to the volume they supplement.

We pick out first for mention a communication from Mr. Poole, one of the numerous volunteers who have assisted the dean throughout in his task. In the Clerk of the Work's Register there occurs the term "middle tread," in the indication of a place of interment in the cloisters. This expression, thus incidentally made, has furnished a clue to the kind of pavement that formerly existed in various parts of the Abbey. It applies, as will be guessed immediately, to the pathway of square stones laid down, the centre of a pavement composed of pieces perhaps placed diagonally. The cloisters were thus paved, with the addition of a course of square stones against the walls. The two ambulatories, and the two aisles of Henry VII.'s chapel, had likewise their middle treads, as may be still traced. It is known, from an old engraving, that the nave and its aisles were also paved in the same manner, though the numerous interments, with the necessary vaults, gravestones, and tombs, had so observed the design when the pavements were repaired about thirty years ago, that it either escaped notice, or was considered beneath it, and these portions of the fabric were laid with a wide field of squares placed diagonally, save a border of square stones against the walls, and a line from pillar to pillar. If the middle tread was of use chiefly for processional purposes, we can see how it came to be disregarded. But this Mediæval arrangement was discernible in the north aisle of the choir and in the western aisle of the transept, when the pavements there were handed over to Mr. Scott for the restoration rendered necessary by decay, and for which the insertion of a heating apparatus offered an opportunity, and the middle tread was carefully perpetuated in both. Besides the recovery of a term that was familiar in the mouths of those who have gone before us, and the certainty of a feature of the fabric all traces of which were fast being obliterated, there is another interest in this subject. Ben Jonson's grave is described as "18 in. of square ground in the abbey, which we know to have been one of the square stones in the middle tread; for the account says of it that it was in the path of square stone (the rest is lozenge) . . . . in a pavement-square of blue marble about 14 in. square."

Mr. Poole says,—

"This clearly refers to the small stone which Dean Buckland found lying about (it having been displaced for the new pavement), and which he caused to be placed in the riser of the stone seat adjacent, and opposite to Ben Jonson's grave. This stone is exactly 17 in. wide, and has no doubt been 17 in. high, being the normal size of all the squares of 'middle treads,' and also the length of the diagonal of a 12-in square, which latter is the normal size of all the lozenges. It has been reduced for some reason to 14 in. high, and is of Purbeck marble, which, when polished and undecayed, is of a blue colour."

The dean's account of the search for the grave of James I. is pleasantly told. If he has thought well to tone down a supercilious pungency that here and there flashed upon the page in his first volume, as in the reply of Bishop Grossetete to the anxious inquiries of Henry III. concerning the precise grace to be wrought by the unction, for instance, he will have no cause to retrace his steps and, with graver emphasis, elaborate his freshest impressions of the discoveries made in the course of this quest. With bated breath and beating heart he seems to stand, bare-headed, by the various vaults and describe their contents to those unable to see into them for themselves. And lest our readers should wonder why the search was undertaken, we must explain that the dean considers "that the interest of a great national cemetery like Westminster Abbey depends, in great measure, on the knowledge of the exact spots where the illustrious dead repose;" and as this information was missing in the case of the monarch in question, or rather, as opposite statements were in existence concerning his place of burial, the joint sanction of the Lord Chamberlain and of the First Commissioner of Works was obtained, and excavations made on the spots indicated by the aforesaid accounts. It was Mr. D. C. Bell, of the Privy Purse Office, who first pointed out the contradictions of Keepe, Crull, and Dart to the statement in the abbey register, that the monarch was buried in the tomb of Henry VII. Two of these authorities, the first-mentioned of whom wrote only fifty-six years after the death of James, placed the remains of the Scottish king in a vault on the north side of that tomb; and the third named a vault at the east end of the north aisle, where two of his daughters were buried, as the true spot, adding on another page a conflicting statement that the king and his queen rest together in a vault by the old Duke of Buckingham's tomb. Curiously the true statement in the abbey register was not credited till the other clues had been followed and proved valueless. The first excavation made was at the north-eastern angle of Henry VII.'s tomb, where it was concluded the king and queen would be found lying together. Four large coffins lay in the vault that was disclosed by the removal of the marble pavement. They proved to be those of the Duke and Duchess of Argyll and two of their daughters. The next spot opened, which was that between Henry VII.'s tomb and the Villiers Chapel, yielded no results; but west and south of it three vaults were found, which were examined. One coffin only lay in the first, which was the one nearest to the dais west of Henry's tomb. It was roughly shaped to the human form, and bore an inscription on a silver plate, which declared these lead-coated remains to be those of Cromwell's favourite daughter, Elizabeth Claypole. The other two were empty. The Sheffield Chapel was next opened; and here a wide brick vault was found of the dimensions given by Dart, and in it lay a long leaden coffin, shaped to the form of the human body, on which was a brass plate, recording the name and titles of James's queen, Anne of Denmark. But still no king. A thrilling impression began to take root among the investigators that some evil-doers must have been at work; and it was (erroneously) thought likely the Parliamentary soldiers, when in possession of the chapel, might have rifled the grave. Further excavations, however, were made. First, eastwards of the queen's resting-place, where a wall was soon found, which opened into the Sheffield vault, where lay the coffins of the first Duke and Duchess of Buckinghamshire, and three of their children, with that of the second and last duke. Next, it was resolved to open the vault of the king's mother, Mary Queen of Scots. When this was done a striking scene was disclosed. We quote the account:—

"A vast pile of leaden coffins rose from the floor; some of full stature, the larger number varying in form from that of the full-grown child to the merest infant, confusedly heaped upon the others; whilst several urns of various shapes were tossed about in irregular positions throughout the vault. * * * The first distinct object that arrested the attention was a coffin in the north-west corner, roughly moulded according to the human form and face. It could not be doubted to be that of Henry Frederick, Prince of Wales. The lead of the head was shaped into rude features; the legs and arms indicated, even to the forms of the fingers and toes. On the breast was soldered a leaden case, evidently containing the heart, and below were his initials, with the Prince of Wales's feathers, and the date of his death (1612)."

Close to this lamented young prince, along the north wall, were two full-sized coffins, flattened and distorted by the pressure of four or five smaller ones laid upon them. Though there was no plate upon either, it was easy, aided by Crull's account, to recognise the upper one as that of Arabella Stuart, and the one beneath it, which was saturated with pitch, as that of Mary Queen of Scots. Henry of Oatlands, Mary of Orange, Prince Rupert, Anne Hyde, Elizabeth of Bohemia, ten children of James II., and the eighteen children of Queen Anne, lay in the crowd of coffins around; but still there was no King James. The Lennox vault was next opened; and then that of Queen Elizabeth. In the last lay two coffins, one resting on the other. The wooden case of the great queen's coffin was crumbling away, but enough remained to show it had been constructed with inch elm, with a carved and panelled oak lid laid upon the thickness of elm; and over all, lid included, was a covering of crimson velvet. An illustration is given of the Tudor rose, initials, and date, incised in the centre of the cover. After opening the space between the graves of Edward VI. and George II. and his queen, with no result, the vault of the first of these was explored. In it lay a solitary coffin, "rent and deformed, as well as wasted by long corrosion, and perhaps injured by having been examined before." Close by

* Supplement to the first and second editions of "Historical Memorials of Westminster Abbey." By Arthur Penrhyn Stanley, D.D., Dean of Westminster. With Illustrations. London: John Murray. 1869.

shrivelled up and unsoldered, was found the leaden inscription-plate, which must have been inscribed with the titles of the Protestant king, as the Dean observes, in the short interval of nine days while the body lay at Greenwich, and Lady Jane Grey upheld the hopes of the Protestant party. In the vault, too, lay another relic, a portion of the frieze of Torregiano's altar. An illustration of this work, taken from Sandford's "Genealogical History," gives a poor idea of it, for the perspective is bad, and the proportions out of all reason. The general effect of it, with its monstrously large coat of arms over the cornice, and slender pillars rising out of substantial bases, is more that of the great bed of Ware than that of Torregiano's "matchless altar," which, like that of other work of his period, would be sure to have been exquisite in its proportions as well as details. The frieze, however, it was decided, should be replaced, as nearly as possible in its original position; hence it can now be seen; and the leaden plate that was once upon the poor little prince's coffin was reaffixed to it, and its inscription copied on the pavement over his grave.

The quest was still carried on. An earthen grave in the Montpensier Chapel was next examined, in which was found a leaden coffin of an unknown person, whom the Dean takes great pains to identify as Cromwell's favourite, General Worsley; and at last that which should have been done at first was taken in hand. The excuse for looking in all the places not mentioned in the "Abbey Register" before examining the place indicated in it, was the impression that the entry in it only signified the chapel generally, and not the actual tomb of the royal builder of it, combined with a reluctance to disturb "the sacred resting-place of the august founder of the chapel" till every other place had been searched. The Dean shall tell his own tale:—

"It was with a feeling of breathless anxiety, amounting to solemn awe, which caused the humblest of the workmen employed to whisper with bated breath, as the small opening at the apex of the arch admitted the first glimpse into the mysterious secret which had hitherto eluded this long research. Deep within the arched vault were dimly seen three coffins, lying side by side; two of them dark and grey with age, the third somewhat brighter and newer, and of these, on the introduction of a light into the aperture, the two older appeared to be leaden, one bearing an inscription, and the third, surrounded by a case of wood, bearing also an inscription-plate. The mouth of the cavern was closed, as has been already intimated, by a huge stone, which, as in Jewish sepulchres, had been rolled against the entrance. . . . The third coffin lying on the northern side was immediately found to be that of King James I., as indicated beyond question in the long inscription engraved on a copper plate soldered to the lead coffin. . . . The two other coffins were as indisputably those of Henry VII. and his Queen.'

An illustration by Mr. George Scharf shows this vault and its royal contents. On the breast of the coffin supposed to be that of the Queen is a large Maltese cross, but no inscription; and on her right hand and on her left lie the two kings. The Dean makes a great point of this selection of a last resting-place on the part of the Scottish king, deeming it a piece of policy on his part to engraft his ancient Celtic stock upon that of the Tudor family, through whom he had come into possession of the realm. In like manner, it will be remembered, Charles I. was buried in the vault that held the remains of Henry VIII. and Jane Seymour, at Windsor.

One of the documents inserted in this supplement gives a list of the paintings in the Abbey, which will be read with interest by archæological artists; another tells of relics lent to the Duchess of Gloucester; an account-book refers to "comforting pills," "ointment for the loins," and "hippocras" for the use of the abbot; and to the tiling of the anchorite's house; and the warrant for the disinterment of the magnates of the Commonwealth, extracted from "Collectanea Topographica et Genealogica," appears among the additions. Note has been made, too, of the instances in which workmen or others have scratched their names in old times, in places not expected to be seen. Thus, on the Ormond vault, in which Oliver Cromwell was interred, were found, rudely executed, the names R. Donkley and Walter Mill Gerford, dated 1683, and others coming down to 1704. Again, in Henry VII.'s vault, occur the name John Ware, and initials E. C., both dated 1625, which specimen of caligraphical indiscretion has been the means of bringing them into posthumous disgrace, for the Dean concludes that they must have both been privy to the theft of the rich velvet pall that once covered the coffin of Henry VII., but which must have disappeared at that time, as no trace of it was to be seen when the vault was opened a few months ago.

No one will find fault with the Dean for yielding to the enchantment that makes every one anxious to return again and again to the alluring Abbey. And the majority of those who revisit it by the light of his guidance will see more in it than they would otherwise. The volume contains a number of illustrations, some of which might be better than they are.

THE ADAPTATION OF OUR ANCIENT CATHEDRALS TO THE USAGE AND SERVICE OF THE CHURCH OF ENGLAND.

AT the last quarterly meeting of the Exeter Diocesan Architectural Society, Mr. P. B. Hayward read a paper on the subject at the head of this notice. We print the principal part of it:—

I feel bound to offer a few words of apology to the members of this society for venturing to bring to their notice a subject which has been already ably treated by Mr. G. E. Street in an exhaustive paper read by him at the Liverpool Church Congress last October, but which, perhaps, is not so generally known as it deserves to be. My excuse is, that the alterations that are contemplated in our own cathedral, naturally suggest some inquiry as to the principles which should form the basis of cathedral restoration, or rather adaptation to modern requirements; how far these principles have been kept in view in the restorations that have already taken placé, or are now in progress in other cathedrals; and, as a natural sequence, whether the plans, which are now before the Dean and Chapter for consideration, are in keeping with these principles. I hope, on these grounds, that a few remarks on this subject may prove worthy of consideration by our Diocesan Architectural Society, which has for years past exercised an undoubted, although unobtrusive, influence for good in all matters relating to church building or church restoration, that have been brought within its cognisance. In this paper I intend to deal merely with the architectural part of the question, leaving to abler and wiser pens the task of suggesting any alterations in the constitution of our cathedrals which may tend to bring them more into harmony with the increased activity and earnestness now felt by Churchmen, and so make them in the highest sense of the word the mother churches of their respective dioceses. The one great principle which, as it seems to me, lies at the very root of our public worship, and distinguishes it from all other, is that of *unity* or *one-ness*. We meet together in God's house, before His holy altar, as one family, clergy and laity alike, each with their appointed duties, to worship one God and Father of all; and the problem that has to be solved is to so plan the arrangements and fitting-up of the interiors of our cathedrals (built, as they originally were, for a use and worship differing materially from our own), that this principle may be recognised to the fullest possible extent. The plans of our cathedrals, with their strongly-marked division into nave, choir, transepts, and aisles, undoubtedly present difficulties to the task of adapting them to comprehensive congregational use, and it is only of late years that any attempt whatever has been made to utilise in any degree the naves of our cathedrals for public worship. The services, until quite recently, were invariably confined to the choir; and the nave, usually separated from the choir by a massive screen, merely formed a vast atrium, where people could stroll about at their leisure during the celebration of divine service in the choir, listening to the music, or admiring the architecture, but in no sense feeling that they were in God's house, or able to participate in the service that was going on. The choirs, in order to accommodate the large congregations at the Sunday services were, in our own cathedral at least, crowded with seats to the very altar-steps, in utter defiance of any spirit of reverence, and disregard of the proper use of our choirs or chancels; the laity at the eastern end turning their backs deliberately on the altar, that they might the better see and hear what was going on. I crave the indulgence of my auditors, if I here remind them that the screens which invariably separated the naves from the choirs were not originally intended as a support for the organ, as an ignorant person would naturally suppose from the general practice of modern times. They were introduced in the thirteenth and fourteenth centuries (according to Dr. Hook, in his Church Dictionary), when the distinction between clergy and laity was far more decided than in our Church, to mark as emphatically as possible the termination of the *congregational* part of the church, as opposed to that part devoted to the clergy, and to support the rood or crucifix as an object of adoration to the people. The fiery zeal of the Reformers swept that abomination of Popish idolatry, the rood, from its place; and in later times, perhaps in unconscious satire upon this same idolatry, the rood was replaced by the organ. There were musical enthusiasts in those times. When the Church began to shake off the lethargy in which she had been so long sunk, men began to inquire, amongst other things, whether the empty naves of our cathedrals might not be turned to some account after all; and so they were gradually thrown open for special services when it was wished to accommodate larger congregations than the choirs would hold, but still this was done without any general recognition of the great principle of retaining the proper and distinctive uses of the choir, or chancel, and nave. This principle is most clearly set forth in our Book of Common Prayer. In the rubric just before the order for Morning Prayer, it is enjoined that the "chancels shall remain as they have done in times past," and in the rubrics at the beginning of the Communion Office, we find it ordered that "the Table at the Communion time, having a fair linen cloth upon it, shall stand in the body of the church or in the chancel, where Morning and Evening Prayers are appointed to be said." The words "shall remain" in the former rubric, clearly refer, so it seems to me, to the practice of the early church, and not to those later times when the corruptions of the Church of Rome, by the introduction of subordinate altars to the saints in the different parts of the church, destroyed the purity of the earlier worship. The distinctive uses of nave and chancel, or choir, are very clearly described in the following literal translation of a passage in the decretals of Gregory IX., "That the laics shall not presume to stand or sit among the clerics near the altar, during the celebration of the sacred mysteries, but that that part which is divided by rails from the altar shall be open to the clerics who sing, but for the purposes of praying and communicating that the Holy of Holies shall be open to laics and women;" and in an order made by the Council of Tours in 567, almost identical words are used. This principle is universally recognised in parish churches, where any attempt at correct ritualism is observed; and if so, should it not apply with still greater force in the case of our cathedrals, which are, or ought to be, patterns to their daughter churches? In the recent restorations of the cathedrals of Ely, Lichfield, Hereford, Worcester, Llandaff; and if I mistake not, the Chichester and Durham also, the principle of comprehensive congregational worship, and consequent restoration of the naves and choirs to original uses, has been observed with the happiest results, both architecturally and morally; and Mr. Street, in his rebuilding of the nave of Bristol Cathedral will, of course, act in the spirit embodied in the paper already referred to as read by him at the Liverpool Church Congress. I take leave here to refer to a passage from this paper which, in the clearest manner explains his views of cathedral arrangement, and fully sustains the argument I have endeavoured to maintain. He speaks of three courses as open for adoption. 1st. The use of the nave without any altar or provision for a choir. For this he argues there can be no defence whatever, "unless the service is confined to a sermon and hymns, after the manner of University services." Too much stress, it seems to me, cannot be laid upon the importance of the presence of the altar in our public worship. It is as it were the holy of holies, the embodiment of that presence which gives force and efficacy to our prayers. 2nd. The provision in the eastern part of the nave of a second altar, and a second system of choir-seats. For this, he says, there is precedent in the facts that in several of our cathedrals more than one altar is still used; that in St. Alban's Abbey the people's altar is on the west side of the screen; and that in one of the earliest of our Christian churches, that of St. Apollinaire in Classe, at Ravenna, there is a choir altar in the apse, and the people's altar in the middle of the nave. I may also add that this is further confirmed by the rubric already quoted, which enjoins that the altar shall stand in the body of the church or in the chancel. The objection to this course lies in the reduplication of the choir-seats, and in the retention of the massive screen, which in our own cathedral, at

least in my opinion, goes far to deprive the interior of much of its dignity and proportion. With regard to the third course, I quote his words *verbatim*. "The third course is the removal of the close screen, and the adapting the choir for use by the clergy and choir only, whether the congregation be great or small. And here I would say, *in limine*, that though I should always regret having to remove any old screen, I am painfully conscious that by insisting on its retention, *together with the present use of choirs*, I should not be doing a really conservative work. For it cannot be denied that the choirs suffer much more in effect by the introduction of additional seats, pews, and stalls for the congregation, than they could suffer by the removal of the choir screen, if this be accompanied by the removal of the additional seats. In place of the close screen, an open screen ought to be erected, which need be no bar to sight or sound, whilst it preserves the proper division between nave and choir. The choir will then, of course, be reserved only for choristers, and we should have to do our utmost to increase their number, to which end I think it might be possible to make use of guilds or fraternities, whose members might, at any rate on Sundays and festivals, take their place in the choir. There can be no question that the choristers would be better heard, and the music much more effective, if they were not hemmed in by a crowd of people; whilst the pulpit, placed outside the choir, would generally command the largest area which the plan of our cathedral admits, and would, like the choir, suit equally well a large congregation or a small one." I might quote much more to the same effect, but this will suffice to show the view that one of the most eminent, as well as conservative and thoughtful church architects of the day takes of this deeply important question. These general remarks on the principles I have endeavoured to advocate, as forming in many people's minds the basis of all cathedral and church restoration, bring me in the next place to consider their practical bearing in the case of our own cathedral. Do the plans which have been prepared by Mr. Scott for the re-arrangement of the interior, at the request of the Dean and Chapter, accord or not with these principles? With all due respect to that venerable body, and to the eminent architect they have called to their assistance, I venture to contend that in the plans that are now prepared, but I trust not yet finally approved, these principles have not been kept in view. Let me briefly describe the general arrangement proposed. The close rood-screen retains its present position, unaltered, I believe, in any respect, save by the addition of some canopy work at the top. The seats and stall-work of the choir are all new and of elaborate design, except that the ancient and very interesting miserere stalls are, of course, retained, and the arrangement of the seats and stalls as far eastwards as the bishop's throne is nearly the same as at present. Eastwards of the side gates the space nearly as far as the altar is filled with chairs, arranged facing north and south, a broad passage being left in the middle. The altar is backed with a reredos of sumptuous and elaborate design, and a rich pavement of marble and tiles is proposed to be laid. In order to accommodate a larger number of persons than can be seated in the present choir, it is proposed to seat the aisles with chairs, to remove the monuments between the choir and aisles, and to pierce the stone screen at the back of the stalls, for the purpose of enabling those who occupy these chairs to hear and see with greater facility than would be practicable at present. The position of the pulpit is shifted from the western to the eastern side of the entrance to the choir from the north aisle, but the position of the bishop's throne remains unaltered. With regard to the remainder of the building westwards of the screen, I believe no alteration whatever is contemplated. It will thus be seen that the proposed alterations consist merely in the renovation of the choir itself, and in the seating of the choir aisles; the present division of the cathedral into two virtually distinct churches by the massive screen being still adhered to. This, I think, is greatly to be regretted, not merely on architectural grounds (although few people will deny that the beauty of the interior would be greatly enhanced by the removal of the screen), but also on account of the negation of that principle of unity, the importance of which I have endeavoured to demonstrate; and lastly, on the ground of practical convenience, on which I shall have a few words to say presently. As regards the seating of the choir aisles, I cannot help thinking that a serious objection to it lies in the fact of the difference of level between the choir and the aisles. The level of the floor of the choir stalls cannot be less than 3 ft., or possibly 3 ft. 6 in., above that of the aisles, and to this must be added at least 3 ft. more of solid work in the stone screen at the back of the stalls before the pierced work begins, so that the occupants of the aisles would have a solid barrier of 6 ft., if not 7 ft., shutting them off from sight and sound. Besides, it seems to me, that this piercing of the screens behind the stalls would be anything but conducive to the comfort of their occupants, who would be exposed to all the draught from the aisles. Permit me now to describe a plan suggesting an alternative arrangement which was sketched out by my father, at the request of the late bishop as long ago as 1858, and by him submitted to the Chapter, with his full approval. I think I am also correct in saying that the present Bishop of Ely, then Canon Browne, expressed himself strongly in favour of its being carried out. I have little doubt but that this plan, although it appeared to be shelved, eventually led to the fitting up of the nave for the Sunday afternoon services through the liberality of Chancellor Harrington, just twelve months afterwards. This latter arrangement, if I mistake not, was generally understood to be only a temporary and tentative one, and that on its success or otherwise depended whether a more comprehensive scheme should be carried out or not. The success has been undoubted, but unfortunately up to the present time no further steps have been taken in the matter. The great distinction between this plan and that of Mr. Scott, lies in the removal of the rood screen, and the organ placed on it, from their present position, and substituting a light open screen of such construction as to be little or no obstacle to sight or sound, and which shall, at the same time, distinctly mark the boundary between nave and choir. The present screen, minus the organ, is proposed to be re-erected between the westernmost of the columns in the nave, removing all the modern panel-work of the lower portion and the mass of masonry behind it, and substituting for it a glazed screen of tracery-work. In a line with this, across the aisles, corresponding screens would be thrown, the whole forming at the western end of the church a species of narthex, or inner porch, like those frequently met with in foreign cathedrals, and which would undoubtedly contribute materially to the comfort of the congregation. Eastward of this screen, the whole space of the nave, transepts, and aisles would be available for the congregation, the pulpit being placed against the pier forming the eastern angle of the north transept, so as to command, as far as it is possible, nave, choir, and transepts. The choir would be restored to its strictly legitimate use, that of containing the clergy, choristers, and communicants only, the present return stalls, facing east, being done away with, the stalls for the dean and precentor placed nearest to the screen, facing north and south, and the choir-seats also brought near the screen, so as to allow of the musical portion of the service being heard to the best advantage by the congregation. What to do with the organ is the next consideration. It is proposed to place it in the north aisle, immediately behind the choir-seats, a clear passage of about 6 ft. wide being left in the aisle, and the upper portion of the organ carried over this passage, supported by groining. The pipes would fill up the whole of one of the choir aisles, and might also be made to stand boldly out into the choir itself, so as to allow of the sound being as freely transmitted as possible into the body of the church. The lectern would be placed on the western side of the screen, so as to command nave and transepts. All the eastern part of the choir, above the bishop's throne, would be perfectly open and unencumbered with seats.

Oxford Architectural and Historical Society.—The honorary secretaries (the Rev. P. G. Medd, M.A., University College, and the Rev. H. C. Maxwell Lyte, Christ Church) have issued the following notice:—"It is proposed to commence a series of walks and excursions with the view of exploring the neighbourhood of Oxford, and visiting the chief objects of antiquarian interest. It is intended to visit all those remains which illustrate the history of the country during the British, Roman, Saxon, or Mediæval times."

LAMBETH WORKHOUSE COMPETITION.

DESIGNS were received from fifteen of the invited architects whose names we printed a fortnight ago, and are now under consideration. Mr. H. Currey has accepted the invitation of the guardians to assist them in making the selection, and will shortly proceed to examine the drawings. With one exception, a set marked ℣, the designs bear the names of the respective authors.

There is very little architectural art displayed in the designs, nor is it particularly needed; still there is no reason why, without any extra expenditure, good proportions and agreeable forms should not be adopted. Compliance with the instructions, the best means of classification, good arrangements to facilitate administration, healthful rooms, sound inexpensive construction, are points which must first be looked for; but the design which, besides exhibiting these, provides a structure suggesting care, order, harmoniousness, and regularity, should have the preference. The estimates given in the case of the few designs to which particulars are attached vary. Thus while Messrs. M'Murdie and Wagstaffe name 47,500*l.*, Mr. Francis H. Fowler, whose design has considerable merit, puts down 35,700*l.* as the cost. The design by Messrs. Foulsham and Giles & Biven—plan somewhat widely spread out—is estimated at 47,000*l.* Mr. F. Marrable, who, like some of the other competitors, sends two designs, has evidently given good consideration to the subject. Messrs. A. & C. Harston's plans have considerable merit, and the same, in a greater or less degree, may be said of those by Messrs. Beeston, Son, & Beeston, Messrs. C. Gray, Searle & Son, and Mr. P. Parris. Careful weighing of relative merits will be needed in making the selection.

THE ARCHITECT AT THE HOUSES OF PARLIAMENT.

THE following correspondence involves questions of serious interest to the profession:—

Sir,—I have just seen with surprise the following paragraph in a London daily paper:—

"Mr. Ayrton, Chief Commissioner of Public Works, has come to an open rupture with Mr. Barry, the architect of the Houses of Parliament, and the report is widely circulated and believed that Mr. Barry, indignant at the treatment to which Mr. Layard's successor subjected him, no longer holds his appointment. The whole affair will be brought before the House of Commons."—*London Correspondent of the Irish Times.*

My official relations with Mr. Ayrton, as First Commissioner of Works, have always been of a satisfactory and friendly description, and, as far as they are concerned, there is no foundation for the above statement. As, however, I should be very glad of the support of the profession in the trying circumstances in which I am placed, I send you a copy of the letter I have received from Mr. Ayrton, to which, I presume, allusion is made:—

"Office of Works, &c., S.W.
January 22nd, 1870.

"Sir,—I am directed by the First Commissioner of her Majesty's Works, &c., to inform you, that in consequence of various arrangements now being made for the conduct of works under this office, the new Palace of Westminster will, from the 31st day of March next, be placed entirely in the charge of the officers of this department; and that the estimates for that service for the ensuing year will therefore be prepared on their responsibility.

I am further to inform you that the First Commissioner will be obliged to you to have all the contract plans and drawings of the Houses of Parliament, and all other papers necessary for affording a complete knowledge of the building, and of the works carried on in connexion therewith, arranged together and deposited in the office of the clerk of the works, in order that they may, when required, be at once handed over to this department.—I am, &c.

GEORGE RUSSELL, Secretary.

E. M. Barry, esq."

Notwithstanding my experience, in the Law Courts' competition, of the unjust treatment which can with impunity be inflicted upon an architect, I could not but be surprised to receive this letter, coming as it did without previous explanation, without any intimation of dissatisfaction, and at a time when several works under my direction at the building are still unfinished. I have addressed a letter to the First Lord of the Treasury, and to Mr. Ayrton, pointing out, on public and private grounds, the objections to entrusting one of our chief architectural monu-

ments to the sole care of the officials of a department which is constituted, avowedly, without regard to artistic qualifications.

Feb. 14. EDWARD M. BARRY.

The step taken by Mr. Ayrton, although at present not widely known, has excited very considerable dissatisfaction, and has brought us indignant letters from some, who see in it more than is expressed. The motive of the act is certainly not obvious. Mr. Barry holds no salaried office which the Chief Commissioner might think could be dispensed with. He is simply paid his commission as an architect on such works as he is directed to superintend. We believe it is a fact that his estimates have never been exceeded in execution, and that what he has done has met with general approval. With reference to such a building as the Houses of Parliament works are constantly required, proposals for alterations and improvements are constantly arising. At the present moment his designs and estimates for various suggested matters are before the Chief Commissioner. Does Mr. Ayrton think that when future suggestions are made or other works required, the House of Commons will be willing to act on the report of a clerk in the Office of Works, or if the House were willing to do so, that the public would be satisfied? If Mr. Ayrton do think so, we venture to assert he is wrong. An architect of reputation must be called in; and who could be that architect but the man who knows every inch of the work, who was born and bred in it, so to speak, and who, so far as we know, has fully satisfied both the Government and the public? We hope to find that Mr. Ayrton has acted under some misconception.

THE THAMES SUBWAY.

THIS curious work may now be said to be practically completed. The passage under the Thames has been finished for some time past, as also the chambers at each end. During the present week the attention of Mr. Barlow, the engineer, and his assistants has been mainly directed to the application of engine-power to the working of the lifts, by which the passengers are to be let down and taken up by the shafts at the ends of the subway.

From a visit to the works we have obtained a few particulars which may be interesting to our readers. The shafts by which the subway is reached are at each end rather under 60 ft. deep and 10 ft. diameter; they are partly lined with brickwork and partly with iron. At the bottom of each shaft, under the level of the subway, a small steam-engine, of about 4 horse-power, is placed for use in raising and lowering the lifts, and for haulage of the single omnibus by which the passengers will be conveyed. The lift is an iron chamber, with a floor of about 6 ft. by 5 ft., and a ceiling about 6 ft. 6 in. high. The entrance to the lift is by sliding iron doors; on its opposite sides it has pairs of roller wheels which work in guide-rods fastened to the sides of the shaft. The lift is raised and lowered by a chain of great strength, which moves over a pulley at the top of the shaft, and is attached to a balance-weight, which also works between guide-rods. The balance-weight is a slab of cast iron, with an opening in the centre by which it may be loaded according to the number of passengers in the lift. The lift, which weighs about 15 cwt., is further connected with the balance-weight by a wire rope attached to the bottoms of the weight and the lift respectively, and which passes round a pulley at the bottom of the shaft. A brake has been invented by Mr. Barlow, which is attached to the roof of the lift, and is applied by a screw worked from the roof on the inside. The desired effect of the application of the brake is to stop the lift in its descent, not instantaneously but gradually, and within a few feet. On arrival at the bottom of the shaft, the passengers emerge at each end to a waiting-room of about 24 ft. long by 10 ft. wide, with seats along the sides. From this they will pass into the iron omnibus, now completed and ready for its work, which will be run up close to the inner ends of the waiting-rooms. The first part of the journey from each end of the subway is down an incline of about 1 in 30 to the middle of the subway. The haulage up the last part of the ascent at each end will be by an endless wire rope, worked by the steam-engine on the Surrey side. The lift will be seated for seven or eight passengers; the omnibus is seated for fourteen persons. The first-class passengers will descend the shafts last, and the omnibus will be despatched immediately on their arrival at the bottom of the shaft. The omnibus is 5 ft. wide inside, and has cushioned seats with stuffed backs; there is a space of 2 ft. 2 in. between the seats, which are placed lengthways along the sides of the vehicle. It is intended, we believe, to fit up a cross partition in the omnibus to divide the first- from the second-class passengers. A brake, which the conductor will work with his foot, is fitted at each end of the omnibus. The gauge of the rails is 2 ft. 6 in.

The subway and engine-rooms are wonderfully free from water, a hand-pump worked at occasional intervals being sufficient to clear away the accumulations.

It may be expected that this important work, executed at a comparatively small cost, and in a marvellously small space of time, will be opened to the public in a few days.

PROPOSED RESTORATION OF THE WEST FRONT OF WELLS CATHEDRAL.

THE committee have determined to proceed with the restoration of the west front of Wells Cathedral, under the direction of Mr. Ferrey, with as little delay as possible. Mr. Scott's report, which strengthened their determination, may be usefully printed:—

"Having in compliance with your request made a careful examination of the state of the west front of your cathedral,—in the first instance alone, and subsequently in conjunction with your excellent architect, Mr. Ferrey,—I beg to offer a general statement of the opinions at which I arrived:—

Though the Doulting stone, of which this front (as well as the cathedral generally) is constructed, is an excellent material, it happens, nevertheless, that the extreme richness of the design, and the high relief and partially detached form of its features, has, by exposing them in an unusual degree to the direct action of rain on the upper surfaces of their projecting parts, given rise to a very considerable amount of decay.

This decay varies in all possible degrees from a trifling loss of surface to the almost entire destruction of the stone; and the mode of its reparation must consequently vary according to the circumstances of each particular part.

Where, for instance, the decay has not injured the stability of the work, nor in any very serious degree obscured its architectural design, I would leave the work as it is, only endeavouring by some application to protect the surface against the admission of wet which would cause an increase of the decay.

Where—to go to the other extreme cases—the decay has proceeded so far as to endanger the stability of the parts affected, or of others dependent on them (as is in many places the case), or where the architectural design has been lost or seriously obscured by its effects, I would recommend just such an amount of renovation as the particular case absolutely demands, but no more.

In intermediate cases the judgment of the architect and his representative must be exercised in determining the degree of reparation demanded, always leaning towards the minimum, which will give the security required, and always striving to preserve every fragment of stone which retains original workmanship, even though its retention may necessitate increased labour and difficulty. It requires no ability in an architect to condemn and to renew; his skill in works of restoration should be almost wholly directed to *preservation*, for which constant thought and contrivance are required.

I do not know how to suggest any rule for a work in which all the parts differ from one another in condition, excepting that the restoration should in each case be limited to the demands of stability and the permanence of the work and of its artistic design.

I may here suggest that a distinction may often be advantageously drawn between parts of which the forms are purely *mechanical*, such as mouldings, &c., and those which involve higher art, as foliated carving and figure sculpture. The restorer, though he must always be scrupulous, may act more freely in dealing with the former than the latter, inasmuch as, not only can the more mechanical features be generally restored with certainty, while the restoration of more artistic portions must be by guess; but the latter are so precious, that the most correct restoration is almost valueless as compared with even a wreck of the original.

There is one class of work which differs in kind from any which I have mentioned. I refer to those parts which have been renewed some thirty or forty years back. Where these have been executed with a reasonable degree of correctness, they need not be disturbed; but in many instances they are such mere *caricatures* of the original details that it would be libelling the old architects and falsifying their work to allow them to remain.

The detached shafts and clusters of shafts, as well as the abaci of the capitals, have throughout been executed in a hard blue lias, which did duty as marble. Many of the shafts still remain, but the majority are either wanting, or their places supplied by ordinary freestone.

The variety of colour produced by these quasi marble shafts, &c., was as much a part of the intention of the original designer as the architecture itself; and no restoration can be considered worthy of that name which fails to express this intention. It is clear, therefore, that either the same material, or other of similar colour, must be introduced. The abaci which received the rain on their horizontal projections have universally failed; I would, therefore, seek a more durable material for their restoration. It may be the case that for the shafts a variety of lias may be found which is trustworthy. That procured at Keinton, or some particular bed in the quarries there, is of so hard a texture as to be used as a marble; and I think it not unlikely that this may be a suitable material. If not, the next county (Devon) contains abundance of marble which, both in colour and durability, is thoroughly suited to the object in question.

All ties, cramps, dowells, and other metal-work made use of must be of copper; and every open joint must be stopped with the strongest cement. In selecting the stone great care will be required, as some of that now procured at Doulting is of inferior quality.

As regards cost, it is far from easy to give a decided opinion, but from a comparison with the west front at Salisbury recently restored, I should suppose that it will come to from 6,000*l.* to 8,000*l.*

The work should be superintended by a very experienced clerk of the works, and I fear that it would be hardly practicable to carry it out by a specific contract, though a schedule of prices for work of different kinds might advantageously be made the basis of a contract.

I think it will be best to work gradually downwards, stage by stage, from the top, clearing away the scaffolding as the work proceeds.

The ground along the west front and round the north-western angles has been raised above its natural level. This conceals a part of the basements and dwarfs the effect. It will be necessary to remedy this by lowering the levels of the ground.

I will only add that it gives me much pleasure to find that the view I had formed coincides with that entertained by your able architect, Mr. Ferrey, and expressed by him in his report." GEO. GILBERT SCOTT.

CAMEOS.

THE attention of the council of the Art Union of London having been called to some of the works in cameo by Mr. Ronca, recently mentioned in the *Builder*, and feeling the importance of encouraging this branch of art in England, they have commissioned him to produce Mr. Foley's Caractacus as a cameo in hard stone, onyx. This will form part of the prize list either this year or next, together with some cameos in shell. A few years ago the Art Union offered three premiums, for the 1st, 2nd, and 3rd best cameos, of a certain size and character, on which occasion Miss Pistrucci produced a fine work, and obtained the first premium.

ART WORKMANSHIP: SOCIETY OF ARTS.

THE premiums offered to art workmen by the Society of Arts were for subjects under three heads, viz.,—1. For works executed after prescribed designs; 2. Specimens of the application to ordinary industry of prescribed art processes; and 3. Works of a similar character to the prescribed subjects, though not exactly correspondent. Thirty-eight works were sent in under the first heading, twenty-two under the second, and eighty-two the third, being 142 in all. Although many of the works are very creditable, and deserve, and will doubtless obtain, recognition, we cannot consider that full advantage has been taken of the opportunity given. The premiums offered are liberal, the works remain the property of the producer, and the Government Department of Science and Art have always shown themselves ready to purchase the best of the works sent in. However, we do not wish to be understood as underrating what has been sent in, but rather to urge other workmen to enter the lists should premiums again be offered by the Society.

The prize of 15*l.*, in Class 1 of the first division, for a carved frieze, including the human figure (whereof so few of our art workmen know anything) has evoked no competition. For the premium offered for a panel in carved oak, four competitors appear. We give the preference to the panel No. 4, by J. Osmond. The panel by Mark Rogers, jun. (2), is also meritorious. The panel signed W. T. R. (3) is good furniture-work, not likely to be damaged, but has less life and "go" than the preceding. No. 5, unfinished carving in wood, after an entablature of a chimney-piece in South Kensington Museum, is meritorious. For the premium offered for metal panel in low relief, after Virgin and Child, we should place No. 7, by A. Dufour, first; and No. 8, by A. Ostertag, second. No. 7, *tazza*, *repoussé* work in silver, is creditable. Of the three iron knockers, No. 11, by A. S., must be deemed superior; though the other examples, by John Wilkins and Thomas Bayley, have merits of their own. No. 15, metal missal cover, by H. J. Hatfield, is excellent, as good, indeed, as may be hoped for, and cannot fail to obtain the full premium offered. Some niello work, by Jas. S. Gill (16 and 17), after an arabesque by Lucas Van Leyden, and an engraving on copper after the same example, by John Gittins, are satisfactory. The paintings on porcelain are not particularly noteworthy. W. H. Slater and Miss E. Henwood send some of the best. Under the head of embroidery, the portion of an Italian altar frontal (17), executed by the Misses Pfänder, is admirable of its kind.

Passing to the Second Division, No. 42, frame for a miniature, engraved and enamelled on metal, by Alfred Gray, though somewhat tame, is very good. For the premium offered for the most beautiful tablet in moulded or modelled

earthenware, painted with enamel colours and fired, the response is not satisfactory. One competitor, J. B. Evans (44), merits a modified reward. The wrought-iron balcony (60), by William Robson and Henry Robson, deserves great praise, and little less should be said for the balcony (59) designed by G. Emms, and executed by J. Emms & Sons. We will take another opportunity to speak of the works exhibited in the Third Division.

LIVERPOOL ARCHITECTURAL SOCIETY.

At the meeting of this society on the 9th ult., a resolution was passed with reference to a circular from the hon. secretaries of the Architectural Exhibition Society, stating that the exhibition must be discontinued after the present year unless better supported, to the effect that the Liverpool Architectural Society "would see with great regret the discontinuance of the Architectural Exhibition in London, and that it is hoped that members of this society will exert themselves to furnish an adequate contribution of works for exhibition this year."

Mr. G. A. Audsley read some observations upon the brickwork at the new buildings in connexion with the South Kensington Museum, illustrating practically the method there adopted of cutting and setting the bricks, as it had been explained and exhibited to him at the works. He was of opinion that the method there adopted of treating the bricks by a process more allied to that usually adopted with stone, and sawing and rubbing them to a precisely true face, &c., was calculated to insure a much more finished and artistic result in brickwork than could be obtained by casting the mouldings and ornaments, where ornamental brickwork was to be introduced. A long discussion on brickwork followed; most of the members expressing themselves very much opposed to any treatment of a brick which involved removing the "fire-skin" from it, as tending to reduce very greatly its weather-proof qualities: though the general opinion was that the treatment of brickwork illustrated by Mr. Audsley might be most suitable and effective for interiors as in churches, entrance-halls, and such like, suggestions which Mr. Audsley further supplemented by expressing his conviction that it would do equally well for the interior of a dining-room, in place of plastering and paper.

METROPOLITAN IMPROVEMENTS.

The excellent map published annually by Mr. Stanford, of Charing-cross, showing the metropolitan railways, tramways, and miscellaneous improvements, for which plans and sections have been deposited in the private bill office, on the 30th of November preceding the opening of Parliament, is useful for many purposes. It is unfortunate that from the nature of the case such an admirable publication should be in some respects so ephemeral, and that even before Parliament meets so many of the coloured lines should require the application of the sponge, because of the schemes they indicate being already dead. So it is in this instance with several proposed metropolitan railways; the Fulham, Hammersmith, and City; the Islington Railway,—narrow gauge on viaduct from the neighbourhood of Finsbury to Islington, which has appeared in former editions of the map; the East and West Metropolitan Junction and Mansion House; and the North-Western and Charing Cross, from Camden Town to Charing Cross. In the case of the East London Tramways Bill also, there was no appearance before the examiner on standing orders. There are, however, six other Metropolitan Tramway Bills left on foot, the promoters of which propose to lay an aggregate of about 145 miles of road, at a cost of about one million and a half sterling; the promoters of the London Street Tramway Company alone proposing to lay above forty-three miles, and other two companies twenty-seven and twenty-eight miles each. A proposed new market near the Charterhouse has also been dropped.

The most important Bill, as involving works, in the metropolitan district, is that of the Great Eastern Company (Metropolitan Railways, &c.), which is to a great extent a revival, with slight deviations and some additions, of the Bill passed several sessions past, which provides for the extension of the Great Eastern to Finsbury, and the erection of a new station at that new terminus. The new Bill also provides for company yards and works at Leyton and Stamford-hill. The South-Eastern Company have a Bill for a direct line between Greenwich and Woolwich. A line has been already authorised, but from its heavy cost the company shrink from making it, convinced as they are that they could only do so at a permanent loss. The new line is for a deviation which would be more direct and much less costly. By the new project the line would be carried across the foot of Greenwich Park, much nearer the Observatory than the authorised line, and the Board of Trade will, it is believed, oppose the Bill,—an opposition likely to prove fatal. Mr. Brady, the engineer of the company, proposes by a system of cross trenches to make vibration that could reach the Observatory impossible, but his scheme will prove abortive if it fails to convince the astronomical authorities in charge of that important establishment. The Metropolitan District Company has an important Bill for carrying a spur of their system from a point between Southwark and Blackfriars bridges, along under Queen Victoria-street to the Mansion House. The Metropolitan and St. John's Wood Company has a Bill for a short extension of their line westwards to the Edgware-road at Kilburn.

Among the miscellaneous Bills there is one for a subway from Arthur-street, Cannon-street, to pass under the Thames to a point at the south end of London Bridge, whence it will pass under High-street, Borough, to the south side of St. George's Church. Mr. Peter Barlow is its engineer, and it may be supposed that the work will be executed after the pattern of the Tower Subway just completed so successfully. In connexion with the Thames Navigation, certain works, not very important, are proposed at Fulham and Battersea bridges.

OPENING OF THE NEW BATHS IN BATH.

The Grand Pump-room Hotel and Baths, which a company, co-operating with the Corporation, have erected in Bath, are now completed. The hotel was opened last summer, but now the baths also have been opened to the public.

The building was designed to afford to the middle and upper classes the same facilities for the use of the Bath waters as are enjoyed by poor people at the Mineral Water Hospital. The baths occupy the lower part of the south wing of the block, the remainder of the building being appropriated to the purposes of the hotel. The style of the structure harmonises with the façade of the Grand Pump-room and the baths adjoining.

The baths, as described in the local *Chronicle*, are approached on the south wing of the Grand Pump-room Hotel, extending parallel with Bath-street, and are reached through the archway under the wing, on each side. That on the left forms an entrance to several subways, one of which effects a communication with the king's and queen's bath and the Grand Pump-room. Another subway passes under the central passage between the baths, and terminates in the apartments attached to the ladies' swimming-baths. The various pipes connected with the baths are carried through the subways, which render them accessible in case of the necessity of repairs. The vestibule leads to an ante-room, from which a corridor, 180 ft. long, 8 ft. wide, and 14 ft. high, runs, having the baths on either side, and connected at the entrance with the hotel adjoining by a short flight of stairs. At this spot a large hydraulic lift has been erected by Messrs. Stothert & Pitt, ascending the whole height of the hotel, so as to enable patients to be lowered from any story in the building to the baths below. The vestibule, ante-room, and corridor, are heated by a steam apparatus, and are paved with encaustic tiles laid out to pattern, the corridor having a glass roof with ornamentally painted iron framework. The shape of the principal baths is octagonal, and somewhat elongated. They are lined with buff glazed tiles, while the top edge is paved with white marble; seats of that material being provided in each bath. Stone staircases form the descents to the baths, having on either side copper rails fixed on brass standards with gun-metal tops. The valves for supplying or carrying off water are of the simplest construction, and are placed within immediate reach. The walls of the bath-rooms are inlaid for some distance from the floor with white glazed diamond tiles having intersecting buff bands, and small mauve squares at the points of intersection. The floors are laid with hexagonal tiles of a chocolate tint, the spaces between each tile being filled in with black. The doors to the bath-rooms are locked from the outside by the attendant, thus preventing ingress, while the bather inside can open the door by simply turning the handle. One of the rooms has an entrance to the hydraulic lift, and is provided with a crane and other apparatus, by means of which the invalid bather can be easily lowered into the water. Besides the first-class baths, there are reclining, douche, shower, vapour, and injection baths, and these, like those of the first-class, are provided with well-furnished dressing-rooms and every similar convenience. The requisite ironmongery for these rooms has been supplied by Messrs. Tuck & Son.

The ladies' swimming-bath is of ample size and height, and is covered with a light iron and glass roof. The dimensions of the bath are 51 ft. long, by 27 ft. wide, and 33 ft. high. It is approached by a broad and gentle descent of stone steps, and the floor gradually slopes, so that, whilst at the end nearest the dressing-rooms the depth of water is 3 ft. 6 in., it increases to 4 ft. 6 in. at the other extremity. The bath contains 33,150 gallons of water, supplied by a syphon from the King's Bath spring, at a heat of 113° Fahrenheit. A piece of sculpture, by the late Mr. Joshua Wall, of Stroud, called the "Wood Nymph" (a water nymph it surely should have been), has been placed here, being presented by the architects and builders. A general waiting-room is attached to the ladies' swimming-bath, access to it being attained by a flight of stone stairs at the further end of the corridor, and a short passage at the bottom of the stairs, where are hot-air closets on the one side, and private dressing-rooms leading into the bath on the other. The premises will be lighted by gas, for which fittings of an ornamental character have been designed, manufactured, and fixed by Messrs. Tuck & Son. The buildings have been erected, under the superintendence of Messrs. Wilson & Willcox, by Mr. Bladwell, of Bath, for the mason's work; Mr. A. Ridout for the carpenter and joiner's work; Mr. Trewolla for the plumber's work; and Mr. R. Packer for the painter's work. Mr. R. Herridge was clerk of the works. The establishment has been luxuriously furnished.

THE LAW COURTS AND NATIONAL GALLERY.

Sir,—The reply of the Government official was vague and unsatisfactory. Are the Government prepared to accept the responsibility of the delay,—a delay of their own creating?

In the Queen's Speech, while matters of minor importance are paraded, no allusion is made to the deep prevailing distress of the building operatives and others. As a ratepayer, and a heavily taxed one, I object to maintain these operatives by an increased rate charge, while "deliberative parliamentary sanction" has been given to certain public works—the Law Courts and National Gallery. It is a mistake to stop these works for a mere caprice, and drive these men to the workhouse or to the "Emigration Mistake Committee." There is work in this country to take up all surplus labour for the next fifty years.

A Ratepayer.

THE THAMES EMBANKMENT WORKS.

The Metropolitan District Railway works are being now pushed forward, and it is likely that, before the end of the spring, we shall have not only an agreeable promenade and a convenient carriage-way from the City to Westminster, where formerly we had foul and pestilential mud-banks, but that we shall have also the advantage of the railway.

The contractors have now 2,000 men, three locomotives, 250 horses, 280 trucks, and 20 steam-cranes at work. The soil, as it is loosened, is carried off by trains of wagons to the nearest crane station, where it is hoisted to the surface, transhipped to carts, and then conveyed to some convenient landing-stage, and tilted into a barge alongside the Embankment wall, in which it is carried off to the Millwall Docks, where there is a demand for it as ballast. These barges, of which there are 130 engaged in the work, carry back the bricks, the lime, and the sand which are employed in the construction of the retaining walls. These walls, 7½ ft. in thickness, rest upon a foundation of concrete from 2 ft. to 3 ft. in depth, and are carried to a depth of 21 ft. below the level of the rails, above which they rise to a height of 15 ft. 4 in. The width of the

way between them is 25 ft. The roof of the railway is for the most part girder work, the girders being lined with brickwork, but in some parts the vaulted roof has been adopted. The stations will be at Hungerford, Norfolk-street, and Blackfriars Bridge. As soon as the railway is covered in, the contractors employed by the Board of Works will take charge of the surface, and commence to lay down the new carriage and omnibus roadway.

STRENGTH OF BRICKS.

AT a recent meeting of the Glasgow Architectural Society, Mr. John Macdonald, builder, read a paper on the nature and properties of bricks. In the course of it, he said,—Our clay is so pure that it requires to be adulterated. It is particularly so in the case of machine-made bricks. The operation through which the clay passes in the mill, and the pressure it sustains in being forced into the mould produce such an amalgamation, that were the bricks made thus of pure clay instead of good well-burned bricks coming out of the kiln, each brick would be likely to be sent into a thousand pieces. House machine-made bricks are all to a greater or less extent, in proportion to the pureness of the clay, composed of ashes or other substances to keep the clay porous. In the process of burning, steam is produced, and if there be not a safety-valve through which the steam escapes, an explosion is inevitable,—an explosion which completely destroys the brick. Ashes mixed with clay form numerous channels or outlets for the steam, and hence the bricks are preserved. That ashes or other extraneous substances deteriorate the clay, I think must be admitted, but that they do so to such an extent as to impair the usefulness of the brick, may well be doubted. Could bricks be made of pure unadulterated clay, they certainly would sustain a greater pressure; but, on the other hand, it can be shown that bricks made of clay, mixed with ashes, are capable of sustaining a much greater pressure than it is possible to put on them in ordinary erections.

Through the kindness of Messrs. H. More & Son, engineers, of this city, I have had some experiments made as to the pressure bricks are fitted to sustain. No. 1, a machine-made brick (the bricks were produced), made of clay mixed with ashes, stood a pressure of 15 tons, but at that stage wood (yellow pine planks), used to make up the press, gave way, by the brick being pressed through the wood, and in consequence the brick was removed, without sustaining any injury. No. 2, of the same quality and make as the foregoing, sustained a pressure of 50 tons, or 22 cwt. to the square inch; the planks again gave way in this instance also, and the brick was removed from the press unimpaired. No. 3, a brick the same as No. 2, but with more ashes in it, gave way at a pressure of 50 tons. No. 4, of the same make as the foregoing, but so soft as would not stand exposure to weather, gave indications of yielding at a weight of 25 tons, and crushed at 37 tons 10 cwt. No. 5, made from clay taken from a mine, the clay to a slight extent impregnated with iron ore, sustained a pressure of 70 tons, and crushed at 82 tons. No. 6, a common fire-brick, gave way at a pressure of 42 tons. No. 7 is a brick made of common clay, without mixture or adulteration, but to secure burning is perforated with twenty-four holes, from bed to surface, each of ⅜-in. in diameter. This brick splintered at a pressure of 55 tons, and gave way crushed at 75 tons. No. 8 is a fire-brick largely used in Glasgow and elsewhere for facing or ornamenting buildings. It stood the least pressure of any tried; it splintered at 22 tons 10 cwt., and crushed at 30 tons. This, I think, is to be accounted for by the fact that it had a recess in both beds each ⅜-in. deep, and 6½ in. by 2½ in. Of course it was not possible to fill this recess with lime to that extent as to give the recessed part of the brick the same amount of pressure as was on the margin or outer edge of the brick; hence the outer edge gave way, was broken to pieces, when the centre, or recessed part, was none the worse,—quite entire. It is thus evident that a recess of this kind must, and does, impair the bearing power of the brick.

These tests, though very satisfactory in demonstrating the pressure good bricks will sustain in an isolated position, fall far short in showing how much weight they will sustain in a wall when well bedded and compactly built together with good lime. Mr. More, who is an authority in such matters, gives it as his opinion, that "they would sustain 100 per cent. more pressure when thus built than when isolated in the press." My own opinion is that Mr. More is rather under than over the mark; but, even suppose his estimate too high, we can well afford to make large allowance, and still have strength enough left to sustain a much greater weight than it is possible to bring to bear on any wall. Suppose some of the gentlemen present were about to erect a mill, or other building, of five or six stories high, the wall of lower stories (say) three bricks —28 in. thick; and suppose Mr. More's opinion to be correct, every 6 ft. 2 in. of this wall would carry a weight of 60,000 tons. But suppose we take off 50 per cent. from Mr. More's statement, this would still leave strength enough to carry a weight of 30,000 tons,—a weight which could not by any possibility be brought to rest on a wall of these dimensions, 6 ft. 2 in. by 28 in. It will thus be seen that as far as strength and endurance are concerned, architects need not hesitate to employ bricks in any buildings they may have to erect.

A word or two as to the best manner of applying them. Good lime is an essential condition to good brickwork. Three parts of sand to one part of lime shells is the usual prescription. I fear the proportion of sand is rather high; I would reduce it to two and a half. The next point is close bedding. Good lime is only good when used in proper proportion. Light beds and close joints are essential to good brickwork; when these are neglected or disregarded the work cannot be good.

PARLIAMENTARY.

The New Courts of Justice.—Mr. Ayrton, in answer to Mr. Headlam, said that the architect of the new Courts of Justice was engaged, under his direction, in preparing plans for the construction of these courts within the limits of the Act of 1865, and the funds prescribed in it; but he could not inform the hon. gentleman whether those plans would include a communication between the northern and southern sides of the Strand. It was no part of the scheme at present, and there were no funds for it.

The Thames Embankment.—In reply to a question from Captain Grosvenor, the Chancellor of the Exchequer said that eleven acres of land belonging to the Crown below high-water mark were taken for the purposes of the Thames Embankment. Of these 5½ were gone, for which the Crown had no consideration; the other 5½ the Crown had retained, and he concurred with the Commissioner of Woods and Forests that 2½ of the latter should be applied for building purposes, and not laid out in gardens for public recreation.

The Embankment Viaduct.—In reply to Lord Elcho, Mr. Ayrton said that, when the question of making a viaduct from Hungerford Bridge to Wellington-street was before the House, he strongly objected to it, believing the street would never be made. When he acceded to office he wrote a letter to the Metropolitan Board of Works, calling their attention to the recommendations of the committee, and stating that if in their judgment it was for the convenience of the inhabitants of the metropolis, and the interests of the ratepayers, that the construction of that street should be abandoned, he would take upon himself the responsibility of that. He believed they had introduced a Bill for the purpose of abandoning that work. He had also addressed a letter to the Metropolitan Board, calling their attention to the recommendation of the committee, and requesting that in their report they would take notice of any measure affecting any public building in the metropolis, so that he might see whether the building was one under his charge.

Sites of Places of Worship.—Mr. O. Morgan got leave to introduce a Bill to facilitate the purchase and taking of sites for places of worship and schools. The measure is an attempt to extend to the case of persons desirous of purchasing land for sites of places of worship and poor schools the powers which, under the Lands Clauses Consolidation Act, are vested in companies for commercial purposes.

The Serpentine.—In reply to Mr. Dyce Nicol, Mr. Ayrton said that the works at the Serpentine were, under the contract, to be completed by the 15th of April next, provided they were not interrupted by the severity of the weather, or any other unavoidable cause of delay, of which the Government engineer was to be the judge.

REREDOS IN ST. NEOT'S, NEAR LISKEARD

A REREDOS has just been placed in this church, composed principally of hand-painted encaustic tiles. Its length is 19 ft., and the height from the floor is 7 ft. 6 in. There is a panel on each side of the altar, crowned with a Perpendicular heading, and surrounded with a thorn leaf border on a purple ground. The panels contain Our Lord's Prayer, the Apostles' Creed, and the Commandments, all written on the tiles, and have diaper ornamentation in sage green and buff around them. The space above the altar is divided into three compartments, following the form of the larger panels. In the centre one is a cross on a blue diaper ground, and in the others the wheat and vine intertwine with scrolls on a red ground. The texts on the scrolls are, "My flesh is meat indeed," and "My blood is drink indeed;" and at the four corners there are evangelistic symbols. Running along the entire length of the reredos is the text "Come unto me, all ye that labour and are heavy laden." It was presented to the church by a parishioner, and is the work of Messrs. Cox & Son, of London.

THE PHYSICAL COMMOTIONS THROUGHOUT THE GLOBE.

EARTHQUAKES, hurricanes, and other notable phenomena are still taking place with unusual frequency. Reports are still received from Gros Gerau, in Germany, of the continuance of the earthquakes, and lately the violence and number of the shocks seem again to be increasing. For some time they had been but few and slight. On the 3rd ult. three were observed, one between four and five o'clock in the morning, and two between four and twelve o'clock in the evening. No further disturbance seems to have taken place till the 14th ult. On that day, however, three shocks were observed, one at half-past six, one at half-past seven, and one shortly after nine in the morning. Just before four o'clock on the morning of the 16th ult., a shock was distinctly felt, and two slight movements without noise were observed on the following night. It is curious how frequently it is in the night that earthquakes occur. Perhaps, however, shocks which would not be noted by day are felt in the stillness of night or early morning.

A sharp shock of earthquake occurred at San Bernardino, in California, on the 14th ult. There have been hurricanes of unusual force in America, and nearer home, in Scotland, recently, there was a violent hurricane, which, in a narrow line, levelled everything before it. A letter from Bhosanal, in India, gives an account of a terrible catastrophe which occurred there on the 3rd ult. In the afternoon, at five o'clock, thick yellow clouds appeared on the north-west horizon, and foretold a severe thunderstorm. After half an hour's lightning the rain came down in torrents, and the blast increased to a hurricane. The noise and confusion were terrible, and a more awful scene has seldom been witnessed. All the corrugated iron roofs of dwellings and workshops, and of the new station building were torn off and blown about like feathers before the wind: sheets of half a ton weight were carried a distance of 300 yards. The entire roof of the new stores building was torn off, the bare walls only being left. Carriages were thrown off the rails, driven against each other, and smashed; one truck ran away for five miles, at the rate of 20 miles an hour. Large trees were broken off like straw. About 1 in. of rain fell during twenty minutes. The hurricane lasted only five minutes, and blew from west to east.

It is notable that a new description of lava is being thrown from the crater of Vesuvius since the last eruption, consisting of crystallised salt. This beautiful phenomenon is said to have hitherto been unknown, at least to this extent, in volcanic natural history. We may here note, by the way, that of late years the meteoric stones which fall differ in composition from those of older date.

A few years ago, we noted in the *Builder*, before any remark as to it, so far as we know, had elsewhere or before appeared in print, that a luminous arch had appeared by night spreading from the zenith, or nearly so, east and west, down to the horizon. The arch has since been occasionally seen, and in the *Suffolk Chronicle* its recurrence is again noted; and in connexion with a brilliant display of the aurora or northern lights, which is another phenomenon of more common occurrence within the last quarter of a century than it seems to have pre-

viously been. Agitation of the magnetic needle was observed in connexion with this arch or halo. Other strange and new phenomena of a similar kind have been lately observed, especially a coloured halo pending from the zenith, of which Mr. G. Darwin writes in *Scientific Opinion*.

We may finish up these notes by remarking that we also see from *Scientific Opinion* that the bright white equatorial belt of Jupiter has changed colour, or rather has become coloured, —of a fine strong greenish yellow, like yellow lake, which change seems to be rather a portentous sign of the times. It was declared by astronomers some years since, we remember, that the rings of Saturn,—Jupiter's *vis-à-vis*, as we may say—were becoming still more unstable than heretofore, and that any day they might topple over and collapse. The tremendous rapidity of Jupiter's rotation (greater even than the ringed Saturn's), on the other hand, and his belt phenomena, seem to indicate that he, on the contrary, is on the eve of throwing off and establishing a system of rings, perhaps simultaneously with the collapse of Saturn's; and the change of colour of his *equatorial* belt is, therefore, we think, a portentous omen of coming changes, even in the state of our own planet.

THE CONDITION OF THE BUILDING TRADE.

SIR,—The best thanks of the unemployed operatives of the building trades are due to your correspondents, "T. L. D.," and "Senex," for the suggestions which they have made with the view of removing the depression of trade under which we are at present suffering. May we not hope that some member of the Legislature will speedily call the attention of the Government to the unnecessary delay in the undertaking of sanctioned public works, and that some of the many influential readers of the *Builder* will exert themselves in order to put an end to the present unsatisfactory state of affairs?

Both your correspondents, sir, call for a reduction, in what "T. L. D." terms the "extravagant wages" of building operatives. And, strange to say, they both ignore the fact, that in the metropolis the standard rate of wages paid to skilled artisans is 8d. per hour. Your correspondent "Senex," suggests that a "Builder's Foreman" has probably been receiving 7d. per hour, and proposes that he consent to a reduction of 1d. per hour. But is 7d. per hour an "extravagant" rate of wages for a competent "Builder's Foreman?" I should have supposed that two guineas per week would not have been considered an excessive remuneration for an individual satisfactorily performing the duties of responsibility and trust which devolve on a builder's foreman. I am a joiner, sir, at present out of employment. I have been receiving 8d. per hour since the last advance of wages in London, in the spring of 1866, and I am not yet prepared to submit to a reduction; but I will willingly comply with it if your correspondents can convince me that their theories are sound, and that my position would be improved by accepting a reduction of wages.

One hundred years ago, sir, Dr. Adam Smith was engaged in preparing for publication his "Inquiry into the Nature and Causes of the Wealth of Nations." At that time, he tells us, "a carpenter in London, and in some other places, is not supposed to last, in his utmost vigour, above eight years." Thank God, our position has somewhat advanced since that time, and I, for one, am unwilling to retrograde. I do not want "extravagant wages," but I want some one to prove that my present demands are unreasonable. I require, as a skilled artisan, a decent home,—not one of the dens where fever and disease reign, where decency is continually outraged, and where cleanliness is impossible. I desire good and sufficient food and clothing for myself and family; education for my little ones; some food for the mind, as well as the body; I want once in a while to get out of the smoke of London, to breathe the fresh country air, and to view the beauties of nature. I need something for my support while sick and out of work; and from sickness and want of employment we lose, on the average, taking one man with another, not less than eight weeks per annum. I must make good wear and tear of tools, replace them when lost, stolen, or burnt, and often purchase new tools to suit a particular job. I want to provide for my family should I die early, and to put by something to keep me from a dependence on the tender mercies of a Board of Poor-Law Guardians in my old age; and I must confess I do not desire to take my last long rest in a pauper's grave. I want to get all this without occasionally "shooting the moon," and suddenly disappearing from the notice of the landlord, the baker, the butcher, the greengrocer, and other interested individuals. Are these "extravagant" desires? And if not, will "T. L. D." kindly show me the way to accomplish my wishes with my present income, and still to leave an "extravagant" surplus? Then I shall be content to cry *peccavi*, and to admit that my demands have been excessive.

But, sir, is the proposed reduction of wages absolutely certain to bring prosperity to the building trades? From undue speculation, the commercial panic, the increase in the railway fares, and other causes which may be allowed to be placed in the same category as "extravagant wages," we have miles of unoccupied house property in the suburban districts of the metropolis. The workman is asked to submit to a reduction of 12½ per cent. in his wages. Is the builder prepared to submit to a corresponding reduction in the prices of the houses he has already finished? If not, it is folly to believe that he will charge less for No. 6, ——— Terrace, which he contemplates running up next year under reduced rates of wages, than he will for No. 5, which was completed last year at the old prices, and which still remains empty. We want a plain, straightforward answer to this question; for if the value of house property already completed remains unchanged, neither the operatives nor the public will be benefited by the proposed reduction of wages; but, by a quiet bit of legerdemain, the 12½ per cent. will be simply transferred from the wages fund to the profits of capital,—a result which, from the workman's point of view, can scarcely be regarded as "a consummation devoutly to be wished."

At a time when we hear so much of high wages driving trade out of the country, and when the ignorance of the principles of political economy on the part of the working classes is so universally deplored, I would beg respectfully to submit for the serious consideration of your readers the following quotation from the "Wealth of Nations," book i., chap. 10:—

> "In countries which are fast advancing to riches, the low rate of profit may, in the price of many commodities, compensate the high wages of labour, and enable those countries to sell as cheap as their less thriving neighbours, among whom the wages of labour may be lower.
>
> In reality, high profits tend much more to raise the price of work than high wages. . . . In raising the price of commodities, the rise of wages operates in the same manner as simple interest does in the accumulation of debt. The rise of profit operates like compound interest. Our merchants and master manufacturers complain much of the bad effects of high wages in raising the price, and thereby lessening the sale of their goods, both at home and abroad. They say nothing concerning the bad effects of high profits; they are silent with regard to the pernicious effects of their own gains; they complain only of those of other people."

TRYING PLANE.

THE OXFORD SLADE PROFESSOR OF ART.

ON the 8th inst. Mr. Ruskin delivered his inaugural lecture as Slade Professor of Art, in the Sheldonian Theatre at Oxford. In the course of it he said:—Art has of late years received from various sources a very considerable stimulus. Firstly, from the extension of commerce, of which the immediate result has been to increase our jealousy of other nations, and to make us eager to enlarge our wealth by selling our artistic skill. By these means art has been debased, and its true development has been hindered. Secondly, the accumulation of wealth in the hands of a few has created a demand for works of art. Here, too, the effect has been an injurious one, not so much from the fault of the buyer as of the seller, since artists have sought to attract by eccentricity, or by consulting the more popular taste, forgetting that experience teaches us that sooner or later it is the picture best in itself which is most eagerly sought after. Besides this, there is another form of demand for art which is wholly mischievous. It proceeds from the wealthy class, who merely seek by means of art to promote their pleasure or amuse their indolence. This has especially injured sculpture and work in jewelry. As the case is a moral one, so also must the remedy be. Nothing but moral influences can check this evil, which belongs to a luxurious people and a luxurious age. Lastly, the popular demand for art is much larger. There is a general development and improvement in the taste of the lower classes, which we hope may proceed still further, until our very ribands and crockery may exhibit the results of a highly-cultivated taste. He urged that the end which we have to set before us is to establish a practical and critical school of English art, especially in those branches in which English schools show peculiar excellence. There are some directions where, owing to our national character, we are almost sure to fail. For example, he believed we shall never excel in *decorative design*, which needs surrounding influences inaccessible to us. Our great power was the portraiture of living persons. We all need to have a fixed, unselfish purpose for our country and for ourselves. Careless selfishness has too long been our curse. May we not hope that the youth of England will once more rise up to make their country in the noblest sense the leader of nations, flourishing like a tree planted by the waterside, which bringeth forth her fruit in due season? Mr. Ruskin's second lecture was given on the 16th of February, on "The Relation of Art to Religion."

CAUTION TO AUCTIONEERS.

SIR,—On Tuesday, the 25th ult., at the Mart, Token-house-yard, I had eighteen lots of property to offer for sale, the last being the lease of a house in Queen-street, Cheapside, which was to be sold without reserve. The property was knocked down for 375*l.*, and I asked the purchaser to sign the contract. I was engaged for a few minutes, during which time the room was cleared, and he then refused to sign the contract, on the plea that he had given 100*l.* more than he intended. He at first would not give his name; but after my pressing him to do so, I obtained this, and he proposed to go to his employer's office, and come on to mine; afterwards he did so, accompanied by the principal clerk in the establishment, and then coolly asked me if I would take 275*l.* for the lease, which, of course, I declined. My experience has not furnished me a similar case, but on speaking to two leading auctioneers in the City, theirs has; and although the property is depreciated by the course taken, my client has no legal remedy, as to go for damages would be throwing money away. But a stop ought to be put to such a practice.

STANLEY ROBINSON.

CAUTION TO BUILDERS AND OTHERS ERECTING IRREGULAR BUILDINGS.

THE 38th section of the Metropolitan Building Act requires the builder engaged in building or in executing any work to give to the district surveyor notice in writing two days before such building or work is commenced, stating the situation, area, height, and intended use of the building so about to be commenced, &c.; and the 41st section sets forth that if any builder neglect to give notice in any such cases, or executes any works of which he is hereby required to give notice before giving the same, such builder shall, for every such offence, incur a penalty not exceeding 20*l.*, to be recovered before a Justice of the Peace.

In consequence of several of such cases having occurred repeatedly after due warning had been given, the District Surveyor of Stratford-le-Bow and Poplar felt it incumbent on him, in discharge of his duty, to summon five offenders against the law to the Thames Police Court, Stepney, the builders complained of being George Crabb, Ebenezer Alexander, Thomas Hodges, William Walker, and Charles Longley, the two latter being persons who had erected wooden structures.

These cases were heard before Mr. Lushington on Wednesday, the 2nd inst., when each of the defendants was convicted in the penalty of 10*s.* and costs; the defendant, Longley, in two penalties of the same amount, for having caused the erection of two irregular buildings.

At the same time a builder of the name of Stevens was convicted, and ordered to amend an irregularity complained of by the District Surveyor; and three defendants, Allen, Shaw, and another, were also convicted, and ordered to pay outstanding fees, with costs in each case.

NEW WESLEYAN CHAPELS AND SCHOOLS.

THE fifteenth annual report of the Wesleyan Chapel Committee, just now published, shows that the following works have been sanctioned by the committee since the Conference of 1868:—

127	Chapels, at an estimated cost of	£123,726
13	Ministers' Houses, ditto	11,294
29	Schools, ditto	14,859
45	Enlargements and Alterations, ditto	15,456
73	Modifications of cases previously sanctioned, at an estimated *additional* outlay of	24,349
19	Organs	3,287
306	cases	Outlay £192,971

The number of chapels is the largest sanctioned in any one year, though the proposed outlay is somewhat less; the average accommodation being fourteen sittings per chapel fewer than in the chapel erections sanctioned last year. New schools, built in connexion with

new chapels and settled upon the same trustees and trusts, are not separately reckoned. The number of separate school erections is above the average, though fewer than the very large number reported last year.

Two hundred and sixty-four cases have been returned through the May District Meetings, this year, as completed. Of this number, 175 have no more debt than had been sanctioned. These include 88 chapels, 5 ministers' houses, 22 schoolrooms, 39 enlargements and alterations, and 21 organs. The total cost of these cases is reported as follows:—Chapels, 98,499*l.*; ministers' houses, 3,921*l.*; schoolrooms, 19,810*l.*; enlargements and alterations, 14,679*l.*; organs, 3,391*l.*:—Total, 140,300*l.*, being 4,743*l.* more than the amount reported last year, and, with the exception of the year 1867, the largest amount ever reported.

The entire cost of all erections and enlargements, regular and irregular, reported this year as completed, has been 209,744*l.*, being 39,184*l.* less than the sum reported last year, but more than the sum reported in any year except the preceding two years.

The report contains views of a number of the new chapels and schools, of which we reproduce four available examples:—

Ashby-de-la-Zouch Chapel and Schools.—The foundation-stone of the new schools was laid October 2nd, 1867, by Mr. John Hall Joyce, of Breedon. The foundation-stone of the new chapel was laid June 10th, 1868, by Sir F. Lycett. The buildings, erected from the designs, and under the superintendence, of Mr. Nicolas Joyce, architect, of Stafford, are in the Geometrical Pointed style of the fourteenth century. The chapel provides seats for 600 persons. It is 64 ft. by 41 ft. inside, and consists of a nave 25 ft. wide, with a span roof 50 ft. high, and two aisles, each 8 ft. wide, with lean-to roofs. An open porch of three arches, 24 ft. long, within which is an inclosed vestibule the same length, gives access to the lower part of the chapel, and the staircases leading to the galleries. At the other end of the chapel is a class-room, 24 ft. by 12 ft., over which is the organ-loft, the roof of which is carried up to the same height as that of the nave. Adjoining the class-room at one end is a vestry for the minister, and at the other a staircase leading to the organ-loft. Between the nave and the aisles are rows of cast-iron columns, the lower parts of which are octagonal, and the upper parts circular, with foliated capitals; these support arches which carry a clearstory and the nave roof. In the aisles are galleries, the floor timbers resting on brackets cast on the iron columns; there is also a narrow gallery over the vestibule at the end of the nave. The timbers of the roofs and the sittings in the galleries are of red deal. The gallery fronts, the benches, and the pulpit are of carefully-selected pitch pine. The underside of the roof is boarded with pitch pine, and this, as well as the other woodwork throughout, is varnished. A large circular window over the organ-loft, at the back of the pulpit, is filled with stained glass, and the other windows have cathedral glass of amber and green tints. The chapel is lighted by three coronæ suspended from the roof, each having twenty-four gas-jets, and by brackets with double lights under the galleries. It is warmed by hot water; the pipes are square in section, laid on the floor of the passages alongside of the raised cills on which the bench-ends are fixed, and are effective without being unsightly. The walls of the chapel on the ground-floor are two bricks and a half and three bricks in thickness. The walls are faced with red pressed bricks, with bands and patterns of blue bricks, and dressings of Hollington stone: the roofs are covered with slates of varied shades of colour. The principal features, externally, are the clearstory, pierced with circular cusped windows; the entrance arcade, of stone, with carved capitals and parapet of open work; and a large four-light traceried window in the principal gable over the entrance. The cost of the school buildings has been about 600*l.*, and of the chapel nearly 2,000*l.* beyond the value of the materials of the old building. The contractors for the principal parts of the work have been Mr. Proudman, of Ashby; Messrs. Lowe & Sons, and Mr. Bassett, of Burton; and Mr. S. Fish, of Hartshorne.

Mostyn-road Chapel, Brixton-hill Circuit.—In that part of Brixton in which this chapel has been placed, not fewer than 4,000 houses were erected within six years. The chapel designs, including numerous class-rooms, with two large rooms for Sunday-school and other purposes, were prepared by Messrs. Tarring & Son, architects; but it was thought more prudent at first to erect only the chapel and minister's vestry. A contract for this portion of the works was undertaken by Messrs. Myers & Son, for 6,760*l.*

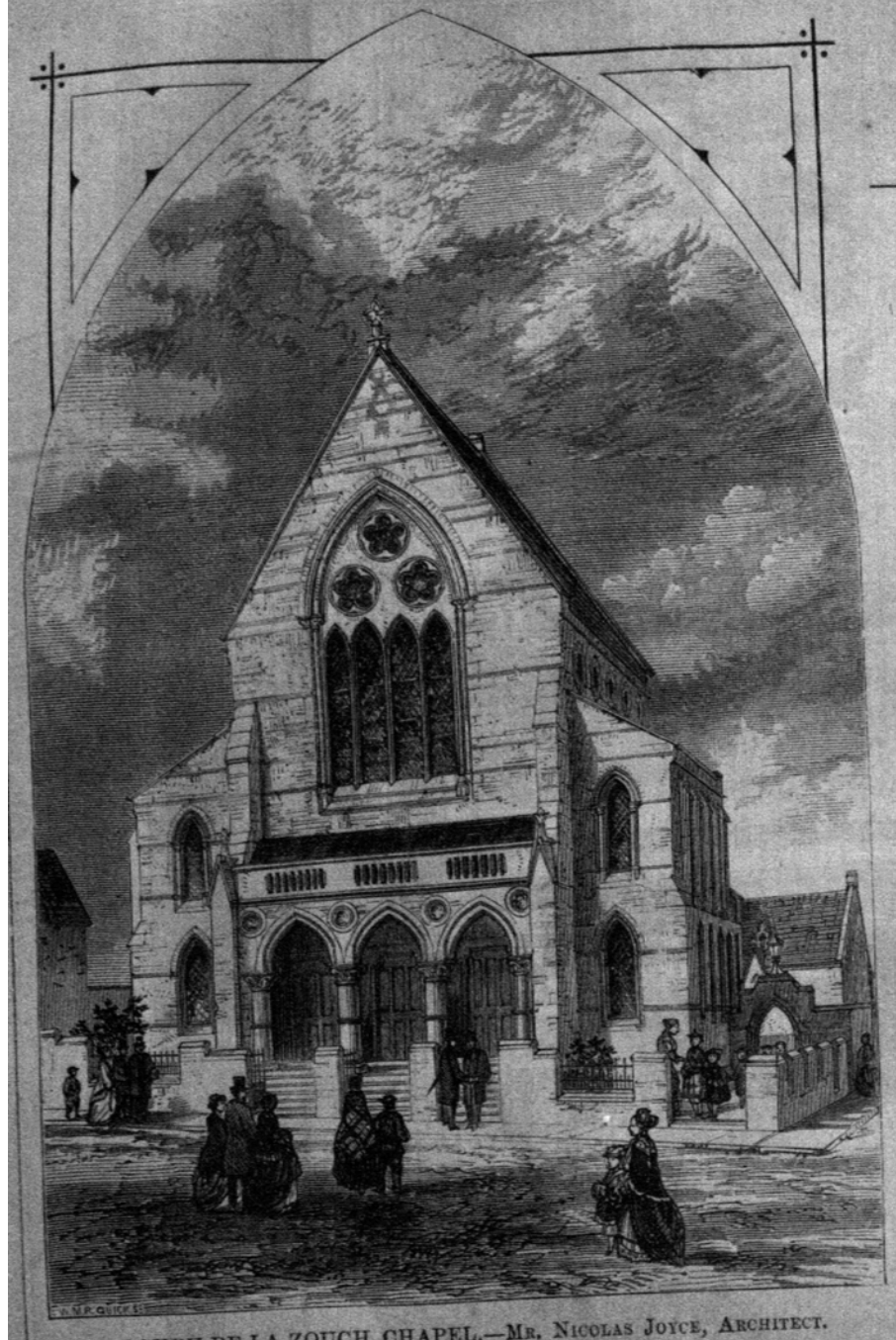
Memorial stones were laid on the 23rd of June, 1868, by Sir Francis Lycett, Mr. Thomas Hazlehurst, and Mr. A. McArthur; and on Tuesday, September 28th, 1869, the building was opened for Divine worship.

Yeovil Chapel.—The necessity for better Wesleyan Chapel accommodation in Yeovil has been long felt. Through the liberality of Sir Francis Lycett, of London, Messrs. Ensor, of Milborne Port, friends in the Yeovil Circuit, and others, the way became open to commence a new chapel. The trustees were enabled to enter into a contract with Messrs. Bartlett & Harewood, of Yeovil, for the erection of a chapel from plans prepared by Mr. Alexander Lauder, of Barnstaple, under whose superintendence the works have been carried out. The foundation-stone was laid on the 22nd of February, 1869. The chapel is in the Early English style, entirely built of local Ham Hill stone by Mr. James Staple, of Stoke. It is calculated to accommodate 650 persons, having side galleries and choir-loft. The gallery pillars are carried up to a swept ceiled roof, dividing the chapel constructively into nave and aisle; the nave having an apsidal termination in the choir-loft. There is a minister's vestry, with basement accommodation at the end of the chapel. The whole of the woodwork is in pitch pine and oak. The chapel is lighted with pendants from the longitudinal arcading over the gallery pillars, and small corona lights under the galleries. It is to be heated with hot water by Messrs. Garton & King, of Exeter. The seats are open, with leaning backs, book-boards, and hat-rails. The total outlay, including site, will be about 3,000*l.*

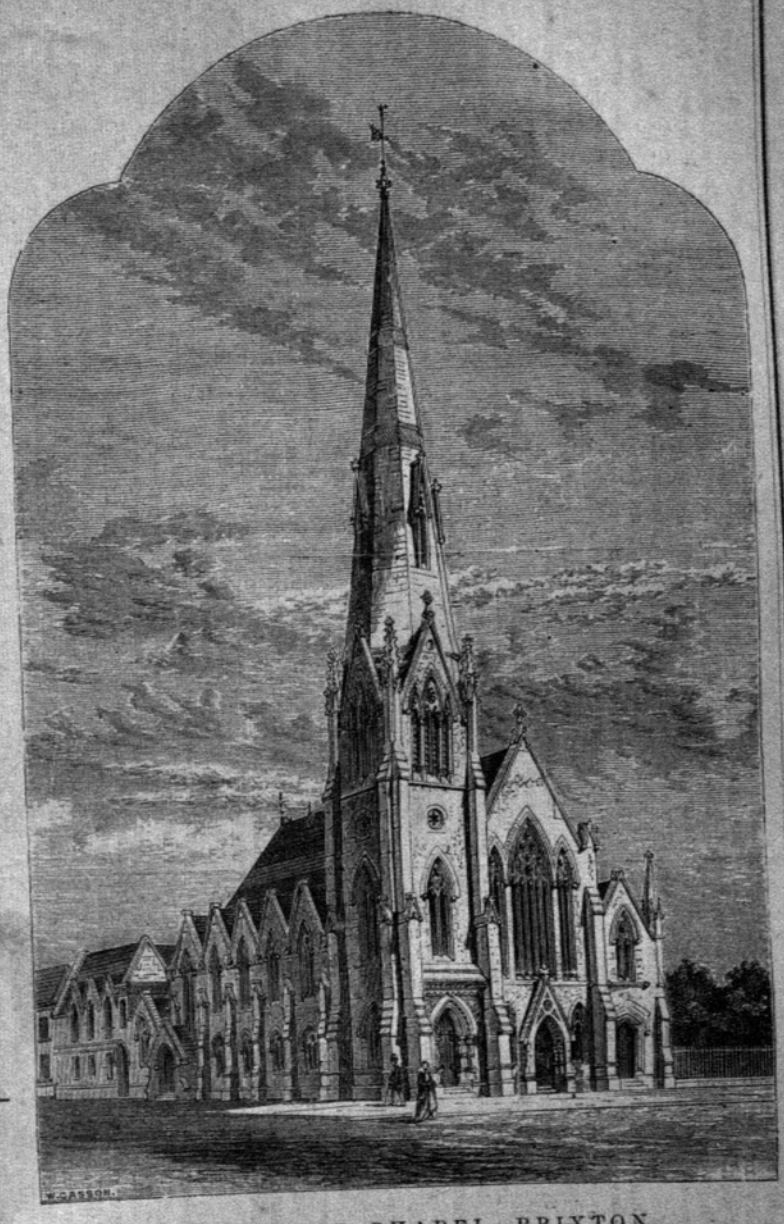
Newton Abbot Chapel and School, Torquay Circuit.—It is asserted that of late years Wesleyan Methodism has made considerable advancement in South Devon. New and commodious chapels have been opened at Ipplepen, Shaldon, Paignton, and Newton Abbot, all within the boundary of the Torquay Circuit before its division last Conference, involving an outlay of 7,000*l.* The foundation-stone of the latter was laid by Mr. John Bowden, of Ipplepen. A spacious school-room at the rear of the property had been previously erected and paid for at a cost of 410*l.* The new chapel was opened on Thursday, May 21st, 1868. The style of the building is Early English, with open roof ceiled at the hammer-beam. The walls are of native limestone, relieved with Bath stone windows, doorways, and pinnacles. The length is 85 ft.; width, 46 ft.; and height to wall plate, 32 ft. The seats are open benches with sloping backs, and lightly stained. The font has a marble pillar, with Bath stone pediment and bowl; and it, and the service-books, communion-cloths, carpets, and cushions, are the special gifts of the society classes and friends. In a recess is a powerful organ. A gallery has been placed over the main entrance lobby for the accommodation of the Sunday scholars. The drawings were prepared at the Devon Office by Mr. J. W. Rowell, and the work has been executed by Mr. G. Hawkins, builder, Newton.

NEWTON ABBOT CHAPEL AND SCHOOL, TORQUAY CIRCUIT.

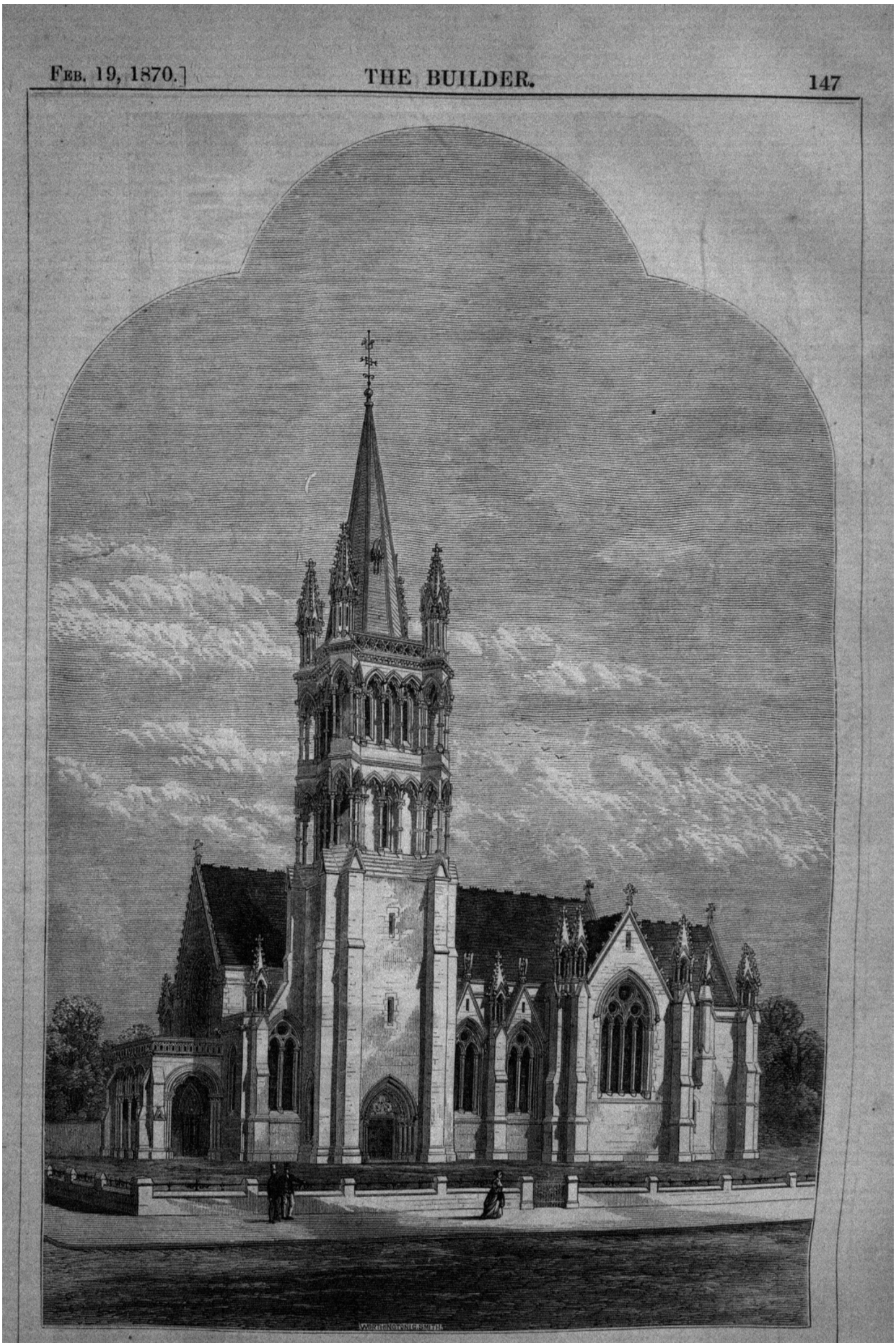
NEW WESLEYAN CHAPELS.



ASHBY-DE-LA-ZOUCH CHAPEL.—Mr. Nicolas Joyce, Architect.



MOSTYN ROAD CHAPEL, BRIXTON.
Messrs. J. Tarring & Son, Architects.



CHRIST CHURCH, FINCHLEY, MIDDLESEX.——MR. JOHN NORTON, ARCHITECT.

CHRIST CHURCH, FINCHLEY.

THE plan of this church includes nave, north and south aisles, north and south transepts, chancel, organ-chamber, vestry, narthex, and tower.

The nave is 92 ft. long by 32 ft. wide, 34 ft. high to stone cornice, and 52 ft. 6 in. to the apex of boarded roof. There is an arcade of five bays to aisles. The columns are quatrefoil on plan, with detached shafts in angles, banded, with moulded bases and carved capitals. The arches are formed of a double order of stone, with a brick upper course of alternate black and red; the spandrels over are of brick, with panels of stone, carved with various emblems: shafts carry principals of the roof. The cornice is of stone, with rich foliage of Early character running the whole length of nave. The roof is formed with double principals, filled in with pierced tracery, and boarded on the under-side, forming a pointed vault. The western door is double, under a richly-moulded arch with foliage in hollow, the tympanum being carved with a representation of the Ascension, the doors themselves are square-headed. Above the west door is a circular rose-window of large proportions, with geometric tracery, the jambs being brought down square with marble columns in angles, and panels of marble of varied colour and design in spandrels, the whole inclosed in moulded arches with labels over. It is filled with stained glass, by Bell. The west gable is surmounted with crocketed copings, and with cross on apex and gurgoyles at angles, a parapet running round nave. The nave floor is tiled. This being the only portion of the design now completed, the arcades are filled in with temporary brickwork; the windows of the future aisles being fixed in it. The aisles are 13 ft. wide, each bay separately gabled with copings and angel finials, and buttresses terminating in canopies. The roofs are internally boarded to pointed vault.

The transepts are 23 ft. by 23 ft., opening from nave by lofty lancet arches, boarded in a similar manner to nave and aisles, and lighted by four-light windows to each, with geometric tracery, crocketed gables, with crosses and rectangular buttresses at angles, with gurgoyles and canopies. The aisle windows are couplets, with circles in head, under moulded arches. The chancel, which is 35 ft. long by 32 ft. wide, opens into the nave by a lofty moulded cusped arch, carried on shafts on foliated corbels. The east window is of elaborate geometric tracery of six lights, separated by shafted mullions, crocketed gable; canopied and crocketed buttresses. The chancel is 28 ft. high to the foliated cornice; vaulting shafts carry ribs of a similar character to nave. It is raised three steps above nave, and the sanctuary three additional steps, besides the altar dais; there are double rows of stalls. The floor is tiled in ornamental patterns. The organ-chamber is separated from the chancel by an archway filled with tracery, and with screens of metal-work.

The tower is situated on the south side of the south aisle. It is 12 ft. square on plan, and is of five stages, the two upper ones having open arcades, with pointed cinquefoil arches, and is terminated with a rich cornice and open parapet, and at angles four octagonal open turrets. The tower is finished with an octagonal spire of slate, the whole rising to a height of 150 ft., finished with a vane.

The narthex, or western porch, is 12 ft. wide, and is the whole width of the nave, arcaded with trefoil cusped arches, with a parapet of open early tracery. The stone used in the construction is Potter Newton, with Bath stone dressings; and the internal lining is of red and black brick, in bands, patterns, and ornamental designs. The roofs are all pointed and vaulted, and covered with Delabole slates and tile crestings. The pulpit has carved and sculptured panels, foliated caps and cornices, with moulded and marble shafts, and inlay of marble and jasper. The font is square on plan, with shafts and inlay of marble. The works at present executed have been carried out by Mr. Henry Wheeler, of Highgate, from the designs and under the superintendence of Mr. John Norton, architect.

Engineering in India.—The Viceroy of India has applied to the Home Government to send out a civil engineer, possessed of special experience, to be employed in examining the coast of India, with the view of discovering sites for ports.

PROGRESS OF HARROGATE.

THERE are evidences of progress on every hand. No new mills are being erected, or mammoth workshops, but the growing prosperity of the town—as an inland spa—is shown by the fact that hotels are being enlarged, and mansions, villas, and houses of a superior character are springing up more rapidly than ever. More and more of those who formerly resided in the suburbs of Leeds, Bradford, and other towns, are taking advantage of the increased railway facilities and coming to reside at this healthful spot, and it seems as if Harrogate will double its resident population before many years have elapsed. Many first-class mansions, for example, have been lately erected in the Victoria Park. They are principally in the Gothic and Italian styles of architecture. The West End Park, situate opposite the Prince of Wales Hotel, now forms a formidable rival to the Victoria Park. The premium offered by the company, who bought sixty-nine acres here, for the best plan for laying out the estate with building sites and first-class villas, was awarded to Mr. Hirst, of Bristol, architect. Either a second premium was awarded to Mr. H. E. Bown, of this town, or an arrangement was come to whereby it was agreed that Mr. Hirst should take the premium and Mr. Bown carry out the design. However, Mr. Bown appears to have the principal management of the estate. There are above 300 sites, we believe, including a site for a church. Many of the mansions in Victoria Park have also been designed by Mr. Hirst and Mr. Bown. Land has been purchased for a new estate in Leeds-road, and a number of houses are to be erected, and operations on a large scale for manufacturing bricks, &c., are to be carried on somewhere in that locality. In fact, a building mania is raging in Harrogate at the present time.

Harrogate Public Rooms Competition.—For the works here Messrs. Shutt & Thompson and Mr. Dyson sent in a plan each, and Mr. H. Bown two. Both Mr. Bown's and also Messrs. Shutt & Thompson's plans provided for a colonnade, 24 ft. wide, extending the entire length of the present terrace, a pump-room, and a ladies' and gentlemen's cloak and retiring rooms, &c. Mr. Dyson's plans provided for a colonnade the same length as the others, but 12 ft. wide, and in addition an elegant covered lounge or conservatory, occupying the entire garden (east) front of the concert-room. Messrs. Shutt & Thompson's and Mr. Dyson's designs included a stone frontage to the pump-room, in a line with the front of the present building, the covered colonnade, &c., being of iron and glass. Mr. Bown's plans were all iron and glass, the pump-room, &c., to the principal front having the appearance of two octagonal conservatories, one with a tower 48 ft. in height. Ultimately the directors, after hearing explanations from the several architects, selected Mr. Bown's plan, No. 1 for the elevation, and No. 2 for the ground-plan. Mr. Bown was instructed to obtain tenders at once, so that the work may be completed by the opening of the season.

A NEW TOWN-HALL FOR POPLAR.

A MEETING of the trustees of the parish of All Saints, Poplar, was held on the evening of Thursday, the 10th inst., at the Board-room of Poplar Workhouse, to receive a report from a special committee who had been delegated to open tenders submitted for the erection of a new town-hall and parochial offices for the use of the parish.

The new buildings have been rendered necessary in consequence of the recent purchase of the old Poplar Workhouse by the guardians of the union; the room hitherto used as a town-hall, with the contiguous apartments occupied by the parish officials as parochial offices, being comprised in the purchase. The guardians paid the trustees the sum of 10,000*l.* for the workhouse and the freehold of the land on which it stands, and the sanction of the Charity Commissioners has recently been obtained for the appropriation of this sum towards the erection of a new town-hall and parochial offices.

The acquisition of a site on which to erect the proposed new buildings has been a task of many months, in consequence of the difficulty experienced in obtaining land which could be regarded as sufficiently central or easy of access. The difficulty was obviated, however, by the seasonable discontinuance of the use of the old parish watch-house by the Commissioners of Police, who have just completed the erection of a more commodious station in the East-India Dock-road. The parish authorities at once opened negotiations with the commissioners, which terminated in the purchase by the trustees of the watch-house and the land on which it stood, the building having since been demolished. Representations were also made to the authorities of Brazenose College, to whom belong a large garden-ground attached to the rectory-house, and adjoining the site of the watch-house; and arrangements were made by which the trustees have acquired a portion of this land. The site is in Newby-place, and immediately facing the principal entrance to the parish church.

Messrs. Harston & Harston, of East-India Dock-road, are the architects of the new buildings; and their estimate for the works was 7,550*l.* The report of the special committee intimated that sixteen tenders had been received, as follows:—

Mann, Kentish-town	£9,300
Corrum, Lewisham	9,268
* Garrod, Commercial-street	8,993
Ennor, Commercial-road	8,670
Watts, Bromley	8,593
Wicks, Bangs, & Co., Limehouse	8,390
Kilby, Limehouse	8,385
Till, Hampstead	8,300
Hearle, St. George's East	8,193
Higgs, Lambeth	8,175
Myers & Son, Lambeth	8,097
Scrivener & White, Fitzroy-road	8,043
Blackmore & Morley, Haggerstone	8,028
Crabb & Vaughan, Kingsland	7,896
Perry & Co., Stratford	7,854
Sheffield, East-India-road	7,479

The committee submitted that, as Messrs. Crabb & Vaughan's, Messrs. Perry & Co.'s, and Mr. Sheffield's tender were the three lowest, the trustees confine their attention to the same, and select that which they thought the most substantial tender.

After some discussion, Mr. Sheffield's tender was accepted; and the committee were empowered—subject to the sureties proposed by Mr. Sheffield being satisfactory—to commence operations at once.

A FIXATIVE FOR DRAWINGS.

CORRESPONDENTS ask us, from time to time, the way to set pencil and charcoal drawings. We have just had an opportunity of testing an invention by M. Rouget, one of the masters of the Government Schools in Paris, for "permanently and instantaneously fixing every kind of fugitive design, such as those produced by chalk, crayons, pastels, lead pencils, or other similar materials." It consists of a liquid which is blown through a little glass apparatus, in the shape of a minute shower that spreads itself over the paper, so that the drawing is not rubbed by a brush being passed over it. Through the fineness of the spray the paper is not cockled, neither does the liquid appear to leave any mark. Our test was severe, and upon rubbing the drawing operated upon, with india rubber, nothing moved, nor was any appearance of a smear produced. It seems a very valuable preparation. According to the London agents, Corbière & Son, it is equally efficacious with photographs.

CAST-IRON GIRDERS, KING'S COLLEGE, LONDON.

SIR,—Your notice in the *Builder* of the 12th inst., page 129, and the accompanying diagrams, shows clearly the cause of the falling in of these girders and ceiling.

It appears from the girders broken by Mr. George Dines to test their strength that the transverse girder A broke with 40·9 tons applied in the centre, and the longitudinal girder *B* with 27·5 tons applied also in the centre.

This experiment would give a constant of about 2·8 for this simple formula; viz., transverse girder A,—

$$\frac{2{\cdot}8 \times 20'' \times 7\frac{1}{2}'' \times 1\frac{3}{4}''}{18 \text{ ft.}} = 40{\cdot}83 \text{ tons B.W. in centre.}$$

Longitudinal girder B,—

$$\frac{2{\cdot}8 \times 15\frac{1}{4}'' \times 7\frac{1}{2}'' \times 1\frac{1}{2}''}{17'\ 8''} = 27{\cdot}2 \text{ tons B.W. in centre.}$$

Therefore the iron must have been *very good*, as ordinary cast iron is seldom calculated higher than for transverse girder A,—

$$\frac{2{\cdot}5 \times 20'' \times 7\frac{1}{2}'' \times 1\frac{3}{4}''}{18 \text{ ft.}} = 36{\cdot}4583 \text{ tons B.W. in centre.}$$

And for Longitudinal Girder B,—

$$\frac{2{\cdot}5 \times 15\frac{1}{4}'' \times 7\frac{1}{2}'' \times 1\frac{1}{2}''}{17'\ 8''} = 24{\cdot}27 \text{ tons B.W. in centre.}$$

And taking ¼ of B.W. as safe load, the trans-

verse girder A would safely support only about 9 tons, whereas the actual weight placed thereon was about 25 tons. And the longitudinal girder B would safely support about 6 tons, whilst it was loaded with about 7½ tons. Again, taking the area of the ceiling and pathway over, to be supported by one of the transverse girders, A, and the three longitudinal girders B (bearing on the former), as 18 ft. × 17 ft. 10 in. = 321 feet superficial. The safe load for the transverse girder A is about 18 tons equally distributed = about 1½ cwt. per foot superficial, and the safe load for the three-longitudinal girders B collectively is about 36 tons equally distributed = about 2¼ cwt. per foot super., and as an ordinary floor should support about 1½ cwt. per foot super. safe load equally distributed, the longitudinal girders B = 2¼ cwt. per foot super. might have been of sufficient strength to support the ceiling, earth, and stone paving of the pathway above, whilst the transverse girders A would be about half the strength required, and hence probably the accident.

CLIFFORD H. CONSTABLE.

*** We insert the above without necessarily agreeing in the deduction.

DERIVATION OF THE WORD "IRELAND."

THE passage in Claudian, inquired for by "S. F. C.," is a puzzle, if we take it literally:—

"Manduerunt Saxone fuso
Orcades: incaluit Pictorum sanguine Thule:
Scotorum cumulos flevit glacialis Ierne."

This was said of the Christian emperor Theodosius the Great; and has been rendered:—"The Orcades flowed with Saxon gore; Thule became warm with the blood of the Picts; and icy *Ierne* wept her heaps of slaughtered Scots." It should be noted that the Scots reached Caledonia *viâ* Ireland, and that the inhabitants of Ireland were long called Scotii by classical writers.

To speak of the "Emerald Isle" as "*glacial* Ireland," is to our present notions a great misnomer; for we cannot now understand that it ever resembled *Iceland* in its characteristics of perpetual snow; but yet it is certain that the whole of the British islands have had their *glacial* era, as is shown by the erosion of lofty rocks, *scratched* by the descent of glaciers, and the distant transport of heavy *boulders*, by the same agency. Ethnologists tell us that, probably, the *thermal* effect of the Gulf Stream did not reach us, from across the Atlantic, till about the twelfth century B.C.; so that, at the date of the fall of Troy, Ireland may have been placed in a very much colder climate. The native Irish word for "ice" is *eirr*, a Celtic word; Welsh, *ia*. I cannot doubt that this etymon, whether or no climatically correct, has furnished the poet Claudianus with his idea of "glacialis Ierne."

I would rather not follow Captain Burton into Punic and Chaldé just at present.

A. HALL.

GLAZING WALLS.

SIR,—In answer to "Alpha," in your impression of Saturday last, I can support by practice what he puts forward as a suggestion. I have very closely examined the pieces of old Assyrian and Babylonian bricks at the Museum of Practical Geology in Jermyn-street, and I have glazed several common bricks with various colours similar to the old specimens referred to, and also painted designs on some and burnt them in, and have been successful in making the bricks non-absorbent, and at the same time ornamental for external and internal work, and I have not the least hesitation in saying, that if the matter were thoroughly gone into, common bricks could be ornamented and made quite impervious to moisture or our London dirt, *at moderate cost*, and every shower of rain would clean our external walls and make the buildings look quite fresh again; and for inside work, we should get permanent ornamental walls, without the expense or use of plaster, paper, or paint. I may also state that I have been successful in glazing red bricks and preserving their colour. This, I believe, has not previously been done. I shall be happy to show any one my specimens, and also a specimen of terra cotta, on which I have burnt in a pattern very successfully.

In writing this, I can but thank my employers, Messrs. James Powell & Sons, who have kindly allowed me to make my experiments and burn in the same on their premises.

I must add that I have spent many hours studying the specimens of old work at the museum in Jermyn-street, and I received many valuable hints and much good information in attending the working men's lectures at that institution. I believe there are some fine specimens of old Assyrian and Babylonian bricks at the British Museum, but I have not seen them, as that building is not open at such hours that many people and art-workmen can go without inconvenience, or it may be, in some cases, loss of time. If it were open only one evening in each week it would be a great boon.

WILLIAM GOLDING.

P.S.—I have now some of my specimens exposed to this severe weather, having first dipped them in water, and up to the present they stand all right. W. G.

GLAZED SURFACES FOR "WATER CORNERS."

SIR,—The inquiries of your correspondent on this subject in your number of the 8th ult. proclaim a difficulty which has troubled architects and others for many years; viz., to procure a material with a sufficiently hard impermeable surface, and which can be made in such a form as to offer the least chance of injury.

I have, in the course of my practice, tried many schemes, but have found them all deficient in one or more particulars. To attain the desired improvement in this most important sanitary provision, I beg to state that in the construction of the "water corners" for the new London Orphan Asylum at Watford, I have arranged to use the material manufactured by Messrs. Finch & Co. in their porcelain baths. Each will consist of four cut slabs built up against slate or brickwork, and jointed together with cement. I fully believe that this form, combined with a proper water service and separate outlet into drain, will fulfil all the requirements above mentioned, except as to the joints.

What is really wanted for perfection, and what I have asked for, but hitherto without success, is a urinal made in this same material *in one piece*, with three sides and a bottom to the proper bevels, and with rounded angles. There cannot be a doubt that it would amply repay some of our porcelain manufacturers to produce this much-needed sanitary article, and which, on account of the enormous demand, ought to be supplied at a reasonable price.

HENRY DAWSON.

WATER FIT TO DRINK.

FEVER and plague are in our lanes,
There's sickness in each home,
And deadly gases from our drains,
Like dire monitions come.
The rich man groans in wild despair,
The poor unnoticed sink:
They die for lack of light and air,
And water fit to drink.

Oh! England, rich in worldly spoil!
In health how poor thou art;
Athirst, thy sons still think and toil,
In workshop, mine, and mart:
Artist and craftsman in their gear,
And authors o'er their ink,
Exhausted, yearn for light and air,
And water pure to drink.

We build to Heaven stately domes,
We circumscribe the earth;
Yet death sits in each lordly home,
As on each lowly hearth.
We eat and drink, yet seldom care,
Till sickness makes us think
Our life's support is light and air,
And water pure to drink.

What boots our power, and what our gain,
In science and in art,
If still unmindful we remain
Of life's important part?
"Man, know thyself,"—this maxim bear
In mind, nor from it shrink:
The God that gave us light and air
Sent water pure to drink.

One strong appeal, an earnest one,
We still make for our poor,
In jail or workhouse, bond or free,
That health they may secure.
Come, kindly hearts and hands, and dare
In noble work to link:
Our people want but light and air,
And water fit to drink.

HOARDINGS.

AT the Police-court, Guildhall, Mr. William Brass, builder, the contractor for erecting the new Post Money-order and Telegraph offices, at the corner of St. Martin's-le-Grand, appeared before Alderman Gibbons in answer to four summonses taken out against him by the Commissioners of Sewers, for putting up a hoarding on the four sides of the plot of ground upon which the offices were to be built without having first obtained a licence from the Commissioners of Sewers for permission to do so, as provided by the Act of Parliament.

Evidence was called showing that the fee for each frontage of the site would be 10*l.* every two months. The Commissioners granted the licences only for eight weeks at a time, no matter how long the building might take in erecting. If in the present case the building took two years, the fees that would be charged would be about 480*l.* It was the practice of the Board to charge for two licences where the building was at the corner of a street, if the frontage in both streets together exceeded 200 ft., which was the limit allowed under a 10*l.* licence, unless the frontage was in one street, and then there was no limit. A copy of the licence was produced, and it contained a stipulation that no bills should be posted on the hoardings, but that they should be whitewashed and lighted.

It was contended for the defendant that the summonses were untenable under the circumstances, and that the defendant could not be held liable; and also that the proceedings were taken by the Commissioners of Sewers very unnecessarily.

Alderman Gibbons said he was of opinion that the Act of Parliament intended that only one licence should be granted for a building, and that the fee should not exceed 10*l.*, but he was also of opinion that the Commissioners of Sewers had the power of saying what should be put upon the hoarding. Mr. Brass had infringed the Act by not applying for a licence before the 24th of January, and for that he should fine him 40*s.*, and 5*s.* for every day since.

This conviction was on one summons, and the other three were withdrawn.

THE FINSBURY PARK ACT.

IN the Bail Court on Thursday in last week (after term Nisi Prius Sittings, before Mr. Justice Blackburn and a special jury), the case of Wing *v.* The Metropolitan Board of Works came on. This was an action brought by the plaintiff against the defendants under the Finsbury Park Act, for having neglected to make proper and convenient means for preserving the communication between the lands belonging to the plaintiff on the west and north sides of Finsbury Park, so as to give the necessary thoroughfares from his lands into and out of the Green-lanes and Seven Sisters-road as required by the Act. Before the conclusion of the plaintiff's case it was arranged to take a verdict for the plaintiff, subject to a special case.

TREATMENT OF SEWAGE WITH CARBON.

MR. HINDE, in allusion to Mr. E. Johnson's last letter, sends a printed quotation from the paper by him read to the Corporation of Lancaster in 1849, when they were about initiating a water-supply and a tubular system of drainage throughout the town. In this quotation he says:—

"It is for you, under the powers of your Act, immediately to interdict the contents of the water-closets being poured into the sewers unless deodorised. To do that, it is only necessary to order every one having a water-closet to bring the soil-pipe, as well as all the sewage-water of house to one point into a tubular sewer, that tube to empty itself into a small tank, 4 ft. deep, and above the level of the main sewer, and connected with it by a grating and tubular sewer, so as to prevent the escape of solid matter. At the bottom is laid a bed, 18 in. thick, of riddled dry ashes, and dry peat charcoal or bog earth, on to which the sewage water falls, and is filtered into the main sewer; a fresh layer is added once a week until the tank is full, and when emptied a stock of valuable manure will be the reward for the labour, and to a great extent a removal of the foul nuisances we all complain of."

"The question," remarks Hr. Hinde, "of the sewage passing through three different tanks supplied with charcoal, as mentioned by Mr. Johnson, or through only one tank supplied from time to time with fresh layers of charcoal, as deserving of a patent, I must leave to wiser heads than mine to decide."

DOCTORS AND DISINFECTANTS.

SIR,—In a communication, entitled "Disinfectants and Doctors," which appeared in the *Builder* of 15th ult., Mr. Brierley, the author of it, expresses his surprise that medical officers of health should differ so greatly as they do in the estimate formed by them of the efficiency of various disinfectants. Divergence of opinion among doctors is, however, not so uncommon as to occasion much surprise to those at all familiar with medical literature. It was, perhaps, to be expected that a matter of so much importance, and one apparently so capable of being set at rest by direct experiment as the question of disinfectants, might have formed an exception, and that long ere this our sanitary officials should have been in a position to agree as to the value of the results obtained from the most generally used disinfecting agents. But the truth is, that extremely few observers approach this subject without prejudice. Two classes of theoretical preconceptions are allowed to warp the judgment in connexion with disinfectants, namely, first, one based on a predilection for microscopical studies; secondly, the other on a bias in favour of chemical pursuits. The former leads to what is called the germ theory of infection, which finds in carbolic acid, as the best germ-destroyer, the most appropriate disinfecting substance; the latter to the transformation theory, which recognises in oxygen the great setter-at-rest of morbid metamorphoses, and consequently the most reliable of disinfectants.

This theoretical difference of opinion has been pointedly alluded to by the medical officer of the Privy Council, in a recently published memorandum, entitled "Precautions against Scarlatina." Chemical disinfectants, it is therein remarked, "are of two great classes, and hitherto it is not certain which of the two acts best. The one class is well represented by chlorine, and certain of its compounds [but better still by ozone]; the other is well represented by carbolic acid. . . . . These two systems do not combine well with one another, and it will be convenient that the local authority should declare which of the two it adopts." It will thus be seen that, contrary to what Mr. Brierley imagines, the matter has had the attention of the Medical Department of the Privy Council. But it is to be regretted that instead of merely chronicling the existence of the two systems, the State Sanitary Office had not thought proper to determine which is most consonant with practical experience.

The two divergent authorities cited in Mr. Brierley's communication, namely, Dr. Trench, medical officer of health for Liverpool, and Dr. Hardwicke, medical officer of health for Paddington, appear to be exponents of these two systems. In the absence of conclusive practical experiments calculated to set at rest the value of oxidising disinfectants such as ozone and chlorine, as compared with germ-destroying antiseptics like carbolic acid, theory, it would seem, must still be the only guide. There is, nevertheless, one thing in respect to which all are agreed, and that is that ventilation is the best natural means of disinfection. But ventilation is a process of oxidating, or, perhaps, rather of ozonising. In purification by fresh air Nature works by means of oxygen, and not by carbolic acid or its analogues. By the addition of carbolic acid to air, that necessary vital element would appear to me to be vitiated instead of being rendered more wholesome. If the remark

made in the Privy Council memorandum above quoted, namely, that "these two systems do not combine well with one another," means anything, it is that oxygen and carbolic acid are antagonistic. But the former substance is the one which is operative in natural ventilation. Carbolic acid, which Dr. Trench patronises, would, therefore, appear to be in antagonism to the purifying operations of nature. Condy's fluid, which Dr. Hardwicke recommends, on the contrary, having ozonic oxygen for its active principle, is in harmony with nature, and merely provides artificially a larger proportion of the vitalising element by means of which all natural purification is accomplished.

It must not be thought that Dr. Hardwicke is singular in his preference for oxygen, or Condy's fluid. On the contrary, in almost every paper of directions for combating infection, issued by the metropolitan and other officers of health, Condy's fluid is mentioned with approbation. This preparation is, moreover, put at the head of disinfecting agents in most standard works on chemistry and medical science which have issued from the press during the last ten years. It is to be found so classed in the following and many other important works: — Knight's "English Cyclopædia" (1860), Chambers's "Cyclopædia," Ure's "Dictionary of Arts, Manufactures, and Mines" (1860), Watts's "Dictionary of Chemistry" (1865), Miller's "Elements of Chemistry" (1868), Holmes's "System of Surgery" (1860), Reynolds's "System of Medicine" (1866).

JOHN MUTER, Ph.D.

LIGHT AND AIR CASES.

THE DYERS' COMPANY *v.* KING.

THIS was a suit tried before Sir W. M. James, to determine the right of the Dyers' Company of the City of London to obtain an injunction restraining the defendant from interfering with the light and air enjoyed by the company's hall, in College-street, Dowgate-hill.

The defendant had taken a lease from the Mercers' Company of two buildings, which until recently stood opposite the Dyers' Hall, one being 35 ft. high and the other 23 ft. high. On the site of these two buildings the defendant began to erect a building 74 ft. high, the height of the plaintiffs' hall being 48 ft., and the width of College-street at this point only 19 ft. The present hall of the plaintiffs was erected in 1840, but in 1856 alterations were made in College-street and Dowgate-hill, which resulted in the widening of both streets at their junction, and subsequently the Charing-cross Railway Company bought some land near the then corner of College-street, and threw it into Dowgate-hill. The plaintiffs' evidence showed that the effect of the proposed buildings would be to intercept nearly all direct light, which formerly passed over the demolished buildings to the plaintiffs' hall, and large models and diagrams were submitted to the Court in substantiation of the fact. The defendant, however, contended that the effect of the alterations in the width of the streets, as above mentioned, and the setting the corner of College-street 7 ft. farther back (as the defendant proposed to do) would be that, though the plaintiffs might lose their direct light, they would acquire, and, in fact, had acquired, so much additional reflected or diffused light as would compensate them for the loss of the direct light. On this point the defendant's counsel contended that the right to light was a right to a certain quantity of light coming from any source, and not a right to receive that light over a particular piece of land or house.

His Honour, in giving judgment, said that he could not accede to the argument of the defendant's counsel. The very terms "dominant" and "servient" tenements as applied to rights of this kind, showed that one person had a right to receive light coming over the servient tenement of another, and could not be deprived of such light because by purchase or gift he had obtained other or additional light. It might be that if the additional light so acquired was greatly in excess of what the owner of the house reasonably wanted, some diminution of the light over the servient tenement might be permitted. But this view clearly did not apply to the present case, in which it could not be said that the defendant would give any compensation for the light abstracted. His Honour being clear the principle of law contended for by the defendant was untenable, it was unnecessary to go into the evidence which had been adduced. It would be a very difficult thing to convince them that any substantial compensation would be given for the loss of light. The plaintiffs must, therefore, have the injunction prayed for; and the defendant must pay the costs of the suit, including the costs of a motion to dissolve an interlocutory injunction.

LECTURES TO WORKMEN.

MR. J. M. CAPES delivered his second lecture on "Forged Ironwork," at the South Kensington Museum, on Monday evening last. He pointed out that among the peculiar qualities of iron, in which it is distinguished from stone, wood, and other materials used in art workmanship, its chief characteristic is tenacity, or toughness. This quality allows of, and calls for the adoption of a special lightness and delicacy, both in design and detail, which are unattainable in any other material. Its influence was shown in calling into play the skill of the artisan in the various processes of his work. This peculiar quality of iron, together with the actual construction of every portion of any work, should be made evident to the observer, on the principle that every work should not only be substantial, and durable, but should appear to be so. The lecturer offered an exposition of the rule that all counterfeits should be avoided in art of every kind, and gave illustrations of the complete or defective observance of these rules. Illustrations were given of the beautiful effects to be produced by the simplest treatment of wrought iron when handled by a workman familiar with its processes, and working upon designs calculated to bring out its characteristic qualities. As an example of singular strength and propriety of construction, beauty of design and excellence of workmanship, the screen in the Church of Santa Croce at Florence was instanced. In this case the effect is produced chiefly by the grace of the structural lines themselves, with but little addition of purely ornamental details.

CONDITION OF DORKING.

WE are glad to find the county press have received our observations in a proper spirit. The *Express*, after reprinting our observations, says:—

"The above description of our town and its inhabitants is taken from the *Builder* newspaper of Saturday, 5th inst. Though the strictures of the writer are in many respects truthful, we cannot for a moment endorse the gloomy opinions he has given expression to, and certainly must protest at the epithet he has bestowed upon it, viz., of being 'a die away place with a mildew upon it.' That much requires to be done in sanitary matters most Dorkingites will readily admit; still, the place is not quite so black as it has been painted, and will, we believe, bear a favourable comparison in point of health with neighbouring towns and other localities of equal population and similar conditions in different parts of the country. As, however, a perusal of the article may be interesting to our readers—both promoters and opponents of 'Local Government'—we give it *in extenso*, and trust its publication will have a salutary effect, and lead to the adoption of some efficient measure with the view of remedying the evils complained of."

So do we. We have no other motive.

SIR,—Your article upon Dorking is much more true than pleasant. Mr. Saubergue has devoted a great deal of time, trouble, and expense in endeavours to improve the sanitary state of Dorking. It is, indeed, a serious question, for the town is never free from fever; but the opponents of sanitary reform say fever always was and fever always will be, and death always was and death always will be. B.

SCHOOLS OF ART.

The Stourbridge School.—The annual meeting of this school has been recently held. The Hon. and Rev. W. H. Lyttleton presided, and there was a considerable attendance. The report of the council stated that the results of the Government examinations had been highly satisfactory, a large number of students having distinguished themselves in the higher grades. It was a source of congratulation that the evening class had maintained its numbers as well as its efficiency; but the council regretted that, from a variety of circumstances, the ladies' class had greatly decreased in numbers, though the fees were only 10s. 6d. per quarter. The school had now been in existence for twenty years, and had done great service to the glass trade, enabling it to maintain its position in the markets of the world against what would otherwise have been formidable rivals. Masters and workmen had likewise benefited by it, and the council expressed a hope that the glass-blowers, as well as other branches of the trade, would avail themselves more of the advantages offered them by the school. The building was admirably adapted for a school of art. It was the property of the council, but it was encumbered with a debt of 600*l*. A lady had made a very handsome offer towards the payment of that debt; but the council had been prevented by badness of trade and other circumstances from appealing to the public for aid. The report of Mr. Bowen (master) stated that he had introduced the study of flowers and foliage as the best exercise for young designers, and had found the system to be attended with beneficial results. He had also introduced actual designs applicable to one of the staple manufactures of the district, and three of the students who had produced their works were awarded by the Government studentships on the school for one year. The report concluded with the expression of a regret that there was an indisposition in the schools of art in this country to study the human figure, and the master believed that to the neglect of this might be traced the superiority of the French designers in taste. The reports were adopted, and the chairman proceeded to distribute the prizes to the successful students for the last two years.

The Darlington School.—The annual exhibition and *conversazione* in connexion with this institution have been held in the Mechanics' Hall. The attendance, though not numerous, was fashionable, and the hall was adorned by some of the best works of the students, and a large collection of engravings, etchings, and drawings, from the South Kensington Museum. Mr. J. Dinsdale was one of the principal exhibitors; three studies of the human figure by him have been selected for national competition. The first of the set is a human skeleton, in pen and ink; the second represents the muscles of the human body, and is done in Indian ink; the third is a chalk drawing of the human figure. The subsequent meeting was presided over by Mr. J. W. Pease, M.P. The eleventh annual report of the school congratulated the friends of the institution and the subscribers, on its continued and increasing success. At the end of the year 1868, the average attendance had increased about 14 per cent. above that of the previous year, and the past year showed a further increase in the average of about 8 per cent., making a total of 22 per cent. in two years. The annual examination took place on the 9th and 10th of March, and out of ninety-six students who presented themselves fifty-seven were successful, and eight were awarded prizes for special proficiency. About 300 works, executed by sixty-seven of the students, were forwarded to London for the annual examination, and those of seventeen students were selected for an award, in the elementary section (the same number as in 1868). The chairman, in the course of his address, as reported in the local *Times*, said:—

"It had been his lot that morning to look over a number of plans and designs of a proposed Convalescent Home at Saltburn, which had been received in answer to an advertisement issued by some of his relatives, and it gave him great gratification to find that those from Darlington were excelled by none, either in artistic beauty or in practical utility. If there was one art in England which had been neglected more than another, it was that of ornamental building. Perhaps this was in no small degree contributed to by the fact that the devices resorted to for the supply of provisions for disastrous wars caused heavy taxes to be laid upon all our buildings, and even upon the very light of Heaven, which was to enter them. When they recollected that on every window, on every brick in its rough state, and especially on every moulded brick, and on every piece of timber used in the erection of a house, there was a heavy charge for duty, they had no cause to wonder at the progress of architecture being slow; and now that these hinderances were removed they found that beautiful buildings of enormous dimensions were rising on every side to embellish our country for all time. During the last two or three months he had visited some of the finest galleries of art in Europe, and he had been astounded to find the degree of perfection arrived at by the artists and architects of 400 or 500 years ago. After running through those magnificent galleries of Venice, Munich, and Vienna, and realising the beauty of thought betrayed by the old masters, and the charming way in which they depicted it,—after witnessing the wonderful art with which they gave an expression to every feature of the face, and a story to every picture,—he was led to the conclusion, so often arrived at before, that there was yet a great field of discovery before the student of to-day, in ascertaining how these colours had been mixed, and an extensive field of labour in endeavouring to attain to that delicacy of touch which they had secured."

PRIZE MEETING OF THE FEMALE SCHOOL OF ART.

THE lecture theatre at the South Kensington Museum was quite filled with an audience of charming young ladies on the 9th inst., Sir Stafford Northcote, M.P., presiding. Mr. Valpy read the annual statement, from which it appeared that the students on the books at present number 122, as against 141 at the close of the summer. The school is free from all debt. Ninety-nine students sent up, on the 9th of April, a total of 1,332 elementary, and 319 advanced works, in competition for national prizes, and the Queen's Gold Medal. Eleven third-grade prizes were awarded in the elementary section, and twelve prizes in the advanced section, making a total of twenty-three prize drawings. The Queen's Gold Medal has been won by Miss Julia Pocock, and her Majesty has been graciously pleased to purchase one of her water-colour drawings, "A Head from the Life." The National Silver Medal has been awarded to Miss Mary Whiteman Webb, for studies of flowers from nature. National Queen's Prizes, consisting of books, have also been awarded to Miss Julia Pocock, for life studies of the figure; to Miss Webb, for flowers from nature; to Miss Alice Blanche Ellis, for flowers from nature; to Miss Emily Slous, for a modelled hand from nature; and to Miss Aimée Messenger, for a botanical sheet. Miss Julia Pocock had taken the 5*l*. 5*s*. offered by Mr. Alexander Macarthur, for the best modelled hand from nature. Miss Ellen Macrae and Miss Sarah McGregor gained the two prizes

for designs for folding screens, given by Messrs. Turner & Sons. Miss Gann gained the third place for the thirty-nine bonuses offered by the Committee of Council on Education, to be competed for by 199 head masters and mistresses of schools of art throughout the kingdom.

The Chairman, aided by Professor Donaldson, having presented the various prizes, pointed out that in this school the prizes represented work done in common with schools of art all over the country, and indicated not only that the successful pupils had done well among themselves and in their own school, but that they had attained a certain standard in competition with all other art schools. The result of these competitions and examinations proved that the school was doing a good work. He had known something of this school for a long time, and he remembered it when it was in a very different position from what it was now in, for in its early history many difficulties were recorded. He contrasted the present excellent premises in Bloomsbury with those which the school had in its early career when turned out of Somerset House, the confined premises at that time occupied being known as the "Soap-shop." Now, he said, it had everything that was needful—good rooms and good teachers. He proceeded to point out that much more was in consequence now expected of teachers and students than could have been expected of their predecessors. If the students to whom these advantages were open pursued their work in a slovenly or desultory manner, they were committing a fraud, not only upon those who were immediately interested, but upon the public. Complaints were now heard louder than ever respecting the want of art-culture in our population, and of the necessity of its application to our manufactures and designs, and it had been found that where proper attention had been bestowed upon studies of designs and manufactures, the character of English art had been raised. Her Majesty took great interest in the school, and, if for no other reason than loyalty, the students should endeavour to use their best exertions in their studies. He had referred to the interest felt in the extension of art education for the benefit of English manufactures, a feeling which was expressed by many under what was known as "technical education." He most cordially desired to see technical instruction promoted, and he believed such instruction to be of high national importance. But he thought that those who were pressing for this kind of instruction should not forget that it was possible to improve, and to connect a development in that kind of instruction with the maintenance of another kind of instruction—viz., in literary education. In the report of a Commission appointed some years ago by the Emperor of the French to examine the condition of technical instruction in Germany and Switzerland, a story was told of a devoted friend and successful cultivator of the sciences. This gentleman, it was there stated, was originally persuaded that scientific study was calculated, as well as the culture of letters, to form the habit of clearly expressing thought in good language, at the same time that it was capable of giving a higher tone to the mind. But, being appointed professor in the Munich Polytechnic Institute, he had to deal with pupils from the trade school or scientific gymnasium, and also with those from the literary gymnasium. He then soon made the discovery that, though the pupils trained to scientific studies appeared at first most competent to follow out their applications, those who came from the literary gymnasia, after completing their studies there, were not long before they surpassed the others. He (Sir Stafford) had brought that quotation with him that he might impress upon the minds of those who heard him what he was desirous of expressing, for what was said in that report of literature preparing men for the study of science was equally true of literature preparing the mind for the study of art. Those who studied art should not only aim to attain the mechanical skill of art, but they should attain to the cultivation and development of their minds with a view of making a better use of that mechanical skill. It was to be remembered that art was not a matter of so much colour upon a bit of paper, but was the expression of ideas, and the mind must be cultivated in order to obtain those ideas. He declared that it was his intention to give a prize to encourage this literary teaching and cultivation in connexion with art studies. He believed the school would take a high place in the promotion of education generally in this country. It would also be the means of raising the status of women. At present it was a most melancholy sight to see one-half of our population treated as if it was an affair *de luxe* to provide for female education. One of the results of education would be to open new fields of employment to female artists and art-teachers, and women would take a place more satisfactory to themselves and more beneficial to the country as a whole.

Sir Digby Wyatt also made an interesting address, in the course of which he expressed a hope that by means of these schools the females of England would acquire that degree of independence which it was desirable they should possess.

Mr. Godwin expressed his intention of offering a prize of 5*l.* 5*s.* for the best shell cameo cut in the school, the cameo remaining the property of the artist. He then moved a vote of thanks to the President and Commissioners of the Council on Education for the loan of the lecture theatre, and to Mr. Cole, the president, and other officers of the Museum.

This was seconded by Professor Donaldson, and carried.

Mr. H. Cole returned thanks, and proposed thanks to Sir Stafford Northcote, which brought the meeting to a close.

ELEVATED FOOTWAYS FOR OVER-CROWDED THOROUGHFARES.

OBSERVING in your publication of the 1st ult. a paragraph on "The Proposal for Widening the Streets of London," and referring to an illustration of Mr. Taylor's suggestions, where that gentleman proposes to set back the shops, and to form a colonnade, arcade, &c.; and considering that London has put its veto against any such arrangements by sweeping away some years ago the colonnade in Regent-street, where it was not only found to be a nuisance in the congregating of loiterers, but inimical to the interest of tradesmen, as their goods were in perpetual obscurity by being in its frowning shade,—I beg to submit a sketch for your perusal, which proposes to construct in overcrowded thoroughfares *elevated footways over the carriage-way*, by placing a series of iron columns on the line of the kerbs of the present footpaths, ranging with the lamp-posts (the columns would answer for the latter), and throw light ornamental girders from each column *over the carriage-way*, and to form on each side footpaths of suitable widths, with crossings at convenient distances, leaving the intermediate space open, the footpaths to be of stout glass, or other suitable material. Access to the footpaths to be gained by staircases springing from the most convenient lateral streets, clear of the main footways. By such a method there would be little or no obobstruction of light, not any obstruction of thoroughfare to either carriage or footway below; it would afford every facility to pedestrians in getting through our, at present, most densely crowded streets, and would be the means of giving a perfectly safe crossing, by keeping clear of the carriage-way. As our most crowded streets are all places of business, should there appear to be any objection in raising a footway to the level of the first-floor windows, let the tradesmen turn these windows into show-rooms. I apprehend there would be nothing lost by this.

C. TATE.

OPENING OF CORN EXCHANGE AND FREEMASONS' HALL, WIMBORNE.

THE new building, with conversion of an old, forming a corn exchange and Freemasons' hall, has been inaugurated. The site is that of the old Wesleyan chapel, near the corn-market, which was purchased at a cost of 500*l.*, by a limited liability company, composed of Freemasons, with shares to the amount of 1,000*l.*, and the remainder required is being raised by subscriptions. The old chapel was demolished, so far as it was found necessary to conform with the designs for the new pile, which had been made by Mr. Walter J. Fletcher, of Wimborne, architect. The space or yard at the entrance was all taken in, and the front of the exchange carried out to the full extent of the property. Then sufficient space was taken out of the building to provide a suitable lodge-room, with its necessary offices, &c., and the whole of the remainder of the space was thrown into the large hall. The building is erected in the Doric style, and consists of a large hall to be used for the purposes of a market-room, county court, and assembly-room for public purposes, which is 60 ft. in length, with an average width of 35 ft. At the main entrance from the open space known as the corn-market, is a portico with three-quarter columns on either side, and capped with an entablature. Above this, on a garter on the pediment, is the motto, "Audi, Vide, Tace," with the square and compasses and the number of the lodge, 622. The hall is approached by a portico, in which are folding doors lighted with glass panels. At the west-end the room is considerably wider than at the entrance, and here is a raised platform which will be used for county-court business, while it can be extended when required for entertainments and other public purposes. The room is lighted by a soffit light in the shape of a Maltese cross, the outside parts being formed of panes of glass, 6 ft. square, embossed with Masonic devices; the central part forming the circle of the cross is formed by a dome, also filled with ornamental glass, and supplies the ventilation. Around the ceiling is a wide double cornice, which tends to take off the deformity of the room. There are two windows on the east and four on the north sides of the room, of figured glass, the circular headings being filled with symbols of Masonry. There are two fireplaces with marble mantel-shelves, and stalls have been provided for the dealers attending the exchange. Underneath is a large cellar, and behind are lavatories, retiring-rooms, and other conveniences. The lodge-room is reached by a flight of stone steps, and the entrance will be from the north side of the building, where there is a porch of similar design to that at the entrance of the corn exchange. This apartment is 28 ft. in length by 18 ft. wide. Both the large hall and the lodge-room are lighted by sun-burners from the ceiling, and bracket lights are also affixed to the walls of each apartment. The floor is of pitch pine, 1¼ in. in thickness, in narrow widths, and connected with galvanised iron dowels. The building was erected by Mr. Richard Froud, of Longham, and Mr. Edsall, of Wimborne and Poole, carried out the decorative arrangements, Messrs. Hopkins & Pike supplying the gas fixtures.

FROM AMERICA.

THE colossal bronze statue of Abraham Lincoln, to be erected in Union-square, New York, has just been completed at the works of Robert Wood & Co., in Philadelphia. It was cast from a model by H. K. Brown, is 11 ft. high, and is said to be a faithful likeness of the original.

Mr. James Lenox, of New York, has asked the Legislature of that State, now in session at Albany, for an act of incorporation for the Lenox Library, an institution which he proposes to found. He offers a site of two acres of ground, with 300,000 dollars, for the erection of suitable buildings, declaring that if this amount should be insufficient for the purpose he will give as much more. He intends handing over to the trustees, as a nucleus for the library, his entire collection of paintings, statuary, and precious volumes, adding that no amount of money shall be withheld that may be needed for making the Lenox Library the largest and most excellent institution of the kind in the United States.

A dollar subscription is in progress at Dubuque, Iowa, for a monument to the memory of the founder of that city. The inscription on the old cedar cross over his grave was:—"Julian Dubuque, Miner of the Mines of Spain, died March 24th, 1810, aged 45½ years."

A second tunnel is to be built under the Chicago River at Chicago, for the purpose of connecting the two divisions of the city. The work has already begun. Under the river, which is 300 ft. wide, it is to consist of three passageways. The east one for foot passengers, and the other two for horses and vehicles drawn by horses. The east passageway is to be 12 ft. high between the bottom of the upper arch and the top of the invert. The width of this passageway is to be 10 ft. The other passageways are to be 11 ft. wide. The opening approaches to the tunnel on each side, and the passageway for horses, are to be paved with wooden block pavement (the whole distance being 1,890 lineal feet), resting on lake shore sand. The contract requires that the river shall be entirely free and unobstructed, as also North and South Water streets, by the 1st day of April, 1871, and the tunnel to be completed and ready for public use by the 1st day of July, 1871. This is about the same length of time employed in the construction

of the Washington-street tunnel. The total cost of La Salle-street tunnel is expected to be upwards of 475,000 dollars.

Under the heading, or "caption," as the *Call* calls it, of "How to Succeed," that paper urges that mechanics should establish business for themselves as soon as they possibly can. No man, as a mere *employé*, gains the position which he ought to hold in the community. The mechanic, after having served an apprenticeship, may find it best to labour for those who are established in business, until he has gained experience and a certain amount of means; but as soon as these points are secured, it is his duty to become a master of his profession, and to place himself in communication with those who seek the services of his craft. The man who works for himself is his own master, which is one important consideration with the mechanic who places a proper estimate upon himself. And then, in times of depression, the man who carries on business need not necessarily be thrown out of employment.

DISSENTING CHURCH-BUILDING NEWS.

Hull.—Fish-street Congregational Church has recently been re-opened, after undergoing a renovation and reseating. The old front, which stood some 8 ft. from the street line, has been taken down, and the church brought out to the street, whereby additional accommodation has been obtained in the gallery. The new front is erected in an adaptation of the Italian style. The building is reseated throughout in red fir and pine, slightly stained and varnished. A new communion-rail, table, and pulpit have also been fixed, these being in oak. The vestibule is paved with Maw's plain tiles, laid to a pattern. The building is lighted at night by means of two large sun-lights, with the brackets beneath the galleries. Mr. Samuel Musgrave, of Hull, was the architect.

Liverpool.—At the corner of St. Domingo-vale, Breckfield-road North, a piece of land has been purchased for the erection of a Methodist New Connexion Chapel and Schools. The expenditure, exclusive of the cost of the site, will be about 4,000*l.* Towards this sum there is in hand, or promised, 1,025*l.* It is intended to have the schools ready for occupation by the beginning of April next, when divine service will be temporarily conducted in them till the completion of the chapel, which will be proceeded with without delay. The chapel will be built in the style of the thirteenth century, and the school-buildings will comprise two large school-rooms, with class-rooms underneath. There will be accommodation in the chapel for 800, and the edifice will contain two side and one end gallery, besides an organ gallery. There will also be a small tower and spire, about 120 ft. high, and the whole structure will be built of red sandstone, with Stourton stone dressings. The architects are Messrs. Hill & Swann, of Leeds and Sheffield. Mr. Thomas Cheatham is chief contractor, and Messrs. Grindrod & Hargreaves are sub-contractors. The chief stone of the schools has been laid.

Croft (near Darlington).—The foundation-stone of a Wesleyan Methodist Chapel has been laid at Croft. It is intended that this new place of worship, the first which the denomination has erected in the village, shall accommodate 180 persons, and its cost is estimated at 550*l.* The contractor for the brickwork and plastering is Mr. Joseph Simpson, and the joiner work is in the hands of Mr. Martin, of Darlington.

Stratford.—The memorial stone of a new Presbyterian church has been laid at the corner of Forest-lane, Maryland-point, Stratford. The builder is Mr. Ennor; and the clerk of works, Mr. Gilron. The church will hold between 800 and 900 persons. The spire is 120 ft. high; the cost of building upwards of 2,000*l.*

Ilkeston.—The Wesleyans of Ilkeston have determined upon building a new chapel in New-street, at a cost of 1,000*l.* Their present chapel, which was built some years since, at a cost of 600*l.*, is in Market-street, an inconvenient place, but the proposed new one will be central. The ground has already been purchased, the price paid being 200*l.*

Staindrop.—A new Wesleyan Methodist chapel was opened in Staindrop, on Tuesday last. The building is of stone; the style Romanesque. The interior has a wagon-headed panelled ceiling, and is fitted up with open benches, to accommodate 200 people. The architect was Mr. John Ross, of Darlington.

Watford.—The new Wesleyan chapel which has been erected in the Queen's-road, at a cost of 1,837*l.* has been opened. The chapel is in the Early English style. The building is ultimately designed for a schoolhouse, as it is proposed to erect a chapel on a piece of land adjoining, but the present building will probably be used for some years to come as a chapel. It contains sittings for about 300 persons. The architect was Mr. Pearson, of Rickmansworth, and the contractors were Messrs. G. & J. Waterman, of Watford.

Shrewsbury.—The memorial stone of St. Nicholas Presbyterian Church has been laid. The plans of the church and school-room were prepared by Mr. R. C. Bennet, of Weymouth, architect. The tender of Mr. Farmer, builder, Ironbridge, was accepted. The total cost of building and site will be about 3,500*l.*

ENGRAVERS OF ORNAMENT.*

A USEFUL little manual of the engravers of ornament, which might well bear elaboration on some future occasion, has been compiled by Mr. Marshall. It contains an alphabetical list of 177 engravers who have occasionally turned their attention to ornament, and gives a few particulars of each of them, briefly told, with intimation of the absence or presence, the abundance or scarcity, of specimens of their works in the South Kensington establishment and in the British Museum. The author says he compiled it for the use of schools of art and public instruction generally. Doubtless it will be useful for both purposes; but it would have been more so if it had been less of a skeleton. The facts selected for mention in the account of each engraver are given in a style which we must be forgiven for calling as dry as old bones. It can scarcely be considered encouraging to students in schools of art to see the birth, the life, the works, and death of an eminent engraver dismissed in six lines. Yet Mr. Marshall has, in several instances, disposed of a gifted and industrious lifetime in still less of his space. This is how he sums up the labours of Rooker:—

"Rooker, Edward, born at London, cir. 1712. This designer and engraver possessed an admirable talent for engraving architectural views, of which he has given an extraordinary example in his large plate of the section of St. Paul's Cathedral, from a drawing by Wale. There are by him also six views in London, after P. Sandby; twelve views in England, after the same; and others."

And then Edward Rooker is laid aside; and Jean le Royer brought before us. Another English engraver, whose name calls up departed coteries, is treated with similar brevity:—

"Basire, James, born at London, 1740. Little is known of the circumstances of his life. He engraved some of the plates which illustrate the publications of the Society of Antiquaries."

And then Antoine François Baudouin, Fleming, is introduced to us. Some of the most known foreign engravers are, however, treated at greater length. We would that Mr. Marshall had made a few inquiries whereby he might have put us into possession of new particulars respecting English engravers. His selection of these has been somewhat arbitrary. Hogarth is not mentioned, although his first efforts were exclusively heraldic, and many of his pieces may be as strictly deemed ornamental, by virtue of their details, as those of Albert Dürer, who is included in the catalogue.

Students consulting Mr. Marshall's book to settle the disputed point respecting the discovery of the origin of engraving, will find that he attributes it to Finiguerra, in the stereotyped manner, although this is now denied. It would have been better to have warned them of this last fact than to have closed their eyes to it.

A point in the little work that must be mentioned with praise is the insertion, in nearly every case, of the monogram or initials affixed by each engraver to his works. These signs are given in facsimile, which will render the identification of a print easy to those to whom familiarity with the subject has not rendered the information needless. Taken collectively, the signatures are exceedingly interesting. Prefixed to the biographical notices is a chronological table of the engravers of ornament, of the Italian, German, Dutch, French, and English schools. A little more amplification will render the work of more serious service. It is a nucleus worthy of the additional labour.

* Handbook of Engravers of Ornament. By Julian Marshall. Printed for her Majesty's Stationery Office. 1869.

Books Received.

"ATCHLEY'S Builders' Price Book for 1870" includes some valuable additional matter, such as prices for the West Riding of Yorkshire; a long list of the principal marks or brands which are to be found on the ends of most deals, planks, &c.; and an elaborate paper by Mr. F. Campin, C.E., on the Application of Iron to Building Purposes. Touching the marks, we cannot go so far as the writer of the Introduction, who says,—"With these tables of reference it is possible for any one quite ignorant of the trade to decide on the description of a parcel of deals, &c., before him, so far as to being certain from whence they came, and the quality which he is buying." Some additional information would be first needed; nevertheless, the list is a beginning, and may lead to what will be a valuable contribution.——"The Body and its Health,"—a Book for Primary Schools. By E. D. Mapother, M.D. Dublin: Falconer. London: Simpkin, Marshall, & Co.—A tiny book on physiology, by a Professor of Physiology, of the Royal College of Surgeons, however well adapted for children—and this one is so—may well be read with advantage by many a parent and other grown person. It is illustrated by twenty-one engravings, but there is room for more.——"A Twelfth Scheme for the Prevention of the Damage by the Flooding of the River Irwell," which flows past Manchester, has been proposed in a printed form by Mr. S. C. Trapp, late borough surveyor of Salford. Mr. Trapp proposes a row of sluices at each of the weirs, such as Mr. Bateman has proposed at Throstle Nest. The cost, he says, would not exceed 15,000*l.* for each weir through the borough, or 60,000*l.* for the four, viz., Douglas, Adelphi, Throstle Nest, and Mode Wheel; including telegraphic communication from one to another of the weirs and sluices.

Miscellanea.

Columbia Market.—The wholesale fish-market, which is to be held here, will open, without any formalities, on Monday morning next. After the wholesale market is over, many persons who have secured standings intend to carry on a retail market there in fish on Thursday, Friday, and Saturday next. Owing to the completion of the railway system over England, packages of the rougher sort of fish (which it will be of great advantage to the poor to be enabled to buy at a cheap rate) can now be brought to London at a low cost. The loan of 27,000*l.* made by the Public Works Commissioners to improve Great Yarmouth harbour (15,000*l.* of which are already expended), is expected largely to benefit the fishing interests. We shall be very glad indeed to find the market successful, but must confess that we do not expect it will be so immediately. The central area has been covered in, and the floorings are formed with Seyssel Asphalte, by Messrs. Armani & Stodart, under contract with Messrs. W. Cubitt & Co., the builders.

Edinburgh Architectural Association.—The usual fortnightly meeting of this Association was held last week, in the Rooms, 5, St. Andrew-square, Mr. William Beattie, architect, in the chair. After the election of several new members, a paper was read by Mr. W. Campbell, entitled "Plaster Work, Ancient and Modern." Mr. Campbell gave a brief historical *resumé* of the origin and development of plaster work in ancient times, proving its extreme antiquity by a number of quotations from the Old Testament and various Greek and Roman authors. Among existing specimens of old plaster work, few remain anterior to the Gothic period of architecture. Mr. Campbell called attention to a number of fine examples of old work to be found in Edinburgh and its neighbourhood. In concluding, he pointed out the chief deficiencies of modern plaster work, and gave some valuable practical hints as to how these might be remedied. A discussion followed the reading of the paper, and the thanks of the meeting were awarded to Mr. Campbell.

St. James's, Taunton.—The tower of St. James's Church, Taunton, is to be pulled down, and a *fac simile* of it is to be built, at a cost of between 3,000*l.* and 4,000*l.* The tower, which is a well-known specimen of the Perpendicular style, has long been in a dilapidated state.

Society for the Encouragement of the Fine Arts.—Mr. Hyde Clarke gave a lecture to the members of this society on Thursday, on "The Culture of the Fine Arts in its Influence on Industrial Pursuits;"—Mr. Henry Cole, C.B., in the chair. The lecturer, after noticing the various aspects under which the subject might be treated, remarked that in nature the beautiful being as widely distributed as the useful, he could not consider the various bodies of artists are mere ministers to wealth and luxury; but, on the contrary, he thought it would be found now, as in former prominent periods of the world's history, that art and commerce always flourished together, and that were it even possible to suppress the fine arts in England it would be necessary to restore them on account of the rivalry of other nations. Next, passing in review the progress of art in England during the present century, and the various events favouring national and foreign industry, he observed that it was not until 1830 foreign rivalry was seriously felt, and then commenting on the great services rendered to art by the chairman in 1835, he ascribed the further improvement of the public taste to the influence of women, whose preference for the more artistic foreign productions, especially in the article of dress, had forced our manufacturers to pay more attention to beauty of form and colour. He concluded with some remarks on the more intelligent administration of the fine arts in France, Prussia, and Switzerland, compared to that of England, insisting that wherever the public taste was neglected the public purse suffered. Dr. Heinemann addressed the meeting with reference to Continental and Prussian art, and was followed by Captain Britten, Mr. Tidey, and Mr. Dutton on the different points raised by the lecturer, and by Mr. Cole, the chairman, who, not agreeing that we were so backward with respect to foreign nations, characterised French art as epicurean, or most excellent when connected with the cultivation of the senses.

The Watford Sewage Question.—At a recent meeting of the Local Board, the chairman read a report of the surveyor (Mr. Lovejoy), which was accompanied with plans and estimates of the proposed deodorising and irrigating works. He proposed to alter the tanks, which were built for the liming process, by raising the bottom and the side and the under walls, and to construct a carrier, filters, &c., as shown in the plans and sections. With regard to the irrigation works, for the quantity of land proposed to be taken, the engine and pumps at the outfall works would be amply sufficient. The report then proceeded to describe the arrangements and process. The cost of these works was estimated as follows:—Alterations to tanks, with filters, sluices, carrier, concrete, brickwork, &c., 235*l.* 8s.; sewers, 507*l.* 14s.; irrigation works, 264*l.* 9s.; total, 1,007*l.* 11s. Mr. Humbert said Lord Essex had offered to let land to the Board for 2*l.* 10s. an acre, and to sell the engine and pumps, &c., for 125*l.*, to be released from all obligations to the Board. Mr. Austin, C.E., explained his process, and exhibited a model of his portable cesspool and filters. Mr. Trestrail recommended his A B C process, and offered to work the system at Watford for 300*l.* a year, or take the manufactured sewage alone as his remuneration, the Board paying the cost of working. Mr. Humbert said that when the tanks were altered, they might adopt either the Stroud or the Leamington system, or use M'Dougall's powder. Nothing could be more economical than the use of sulphuric acid and clay, if it were not for the royalty of 50*l.* a year. Ultimately, the further consideration of the subject was adjourned.

Fall of a Warehouse at Stroud.—The warehouse of Messrs. Ford, Brothers, adjoining Ryeford Mills, Stonehouse, has suddenly fallen in, burying beneath the *débris* a siding running from the Midland Railway into the mills. The warehouses, at the time of the accident, contained 5,000 sacks of grain, and the whole of this, together with two counting-houses and their contents, were precipitated on the siding and into the canal, which was entirely blocked up. The warehouses were six stories high, and built principally of stone; but there is not a single wall left standing; all is a mass of ruins covering an area of about 100 ft. and upwards of 30 ft. high. Fortunately at the time of the accident there was no one on the premises. The general opinion is, that the warehouse was overladen with grain. The damage is estimated at between 1,000*l.* and 1,500*l.*

Sanitary Condition of Exeter.—The death-rate in October, November, and December, 1869, was unusually high in Exeter. The deaths were at the rate of 30 in the 1,000 per annum, while the rate for the whole of the United Kingdom was only 23½. The average death-rate in all the great towns put together was 25⅞ to the 1,000, while in the fourteen monster towns and cities in the kingdom the average was 27½. Exeter was therefore considerably worse than any sort of fair average that could be struck. There are very large towns worse than Exeter, viz., Sheffield, 30⅘ to the 1,000; and Manchester, 30⅔ to the 1,000; but all the other great towns and cities showed less mortality in the quarter. Of the second-class towns, to which class Exeter belongs, there are forty-six, of which only three are worse than Exeter, viz., Blackburn, 38 to the 1,000; Swansea, 31⅘; and Gateshead, 30 9/10. Of the 974 deaths in Exeter, in 1869, 578 took place in St. Sidwell's district (containing the parishes of St. Sidwell, Holy Trinity, St. Mary Major, St. Martin, and the Close), and the remaining 396 in St. David's district, comprising the rest of the city within the municipal boundaries. During the later months of last summer the nuisance of the mill-leet had become more intolerable than ever, as were the foul odours that pollute the valley of Holloway-street. The people who live in that neighbourhood smell the odour in their sitting-rooms and bedrooms, even now, when doors and shutters are closed.

New Baths for Southport.—The new baths about to be erected on the site of the late Victoria Baths, Promenade, will be on a more extensive scale than these were. The accommodation will be as follows:—*Gentlemen's Department*—First-class tepid swimming-bath, 76 ft. by 30 ft.; second-class ditto, 61 ft. by 27 ft.; first-class cold plunge-bath, 46 ft. by 26 ft. Five first-class private baths, each with two dressing-rooms, and shower and douche baths, and water-closet attached; two first-class private medicated bath-rooms; twelve second-class private baths. *Ladies' Department*—First-class tepid swimming-bath, 66 ft. by 28 ft.; second-class ditto, 50 ft. by 26 ft.; first-class cold plunge bath, 27 ft. by 14 ft. Seven first-class private baths, double, as for gentlemen; two first-class private medicated bath-rooms; eight second-class private baths. The whole of the baths will be on the ground-floor, and will be lighted by top lights and ventilated. The entrance, or principal front, will be towards the Promenade, the centre being two-storied. The style of architecture is Palladio-Italian, and the material externally red brick and stone. The directors have arranged to provide Turkish baths. The architects are Messrs. Horton & Bridgford, of Manchester; and the engineer is Mr. Charles H. Beloe, of Liverpool.

The East London Water Supply.—The water of the East London Water Company is declared by Professor Frankland, in a report on the subject, to be "very turbid, owing to the presence of much suspended brown matter full of living organisms. Among the latter vibrios are found." It further appears that in 100,000 tons of water the East London Water Company present their customers with 35 tons of foreign solid matter, including sewage. As the *Tower Hamlets Independent* remarks, "a law which punishes a little grocer for selling dirt as 'tea-dust' ought to be made to reach a body of monopolists which sells sewage under the title of 'pure water.'" The Whitechapel and Limehouse Boards of Works are moving in the matter. The Limehouse Board, at the suggestion of Mr. Arthur Harston and Mr. Blundell, have referred it to a committee for inquiry and report; and the Whitechapel Board have written to the Board of Trade on the subject.

Sewage Self-cleansing Process.—Mr. Latham, the engineer of the Croydon Board of Health, has had one of his patented solid sewage extractors put up at the town-sewage tanks at Brimstone Barn; and the editor of the local *Advertiser* says it is working efficiently. He compares it to a huge tambourine on edge, with six shelves crossing it. The solids are separated, and hence the sewage cleansed, by lifting these solids into barrels, to be emptied by Archimedian screws into tanks, where the soil is mixed with house refuse, to be sold as manure. The water passes through a turbine, and turns the separator. The town sewage is thus filtered by help of one man. New charcoal ventilators for the sewers, patented by Mr. Latham, are being made at an iron-foundry in Croydon.

Railway Matters.—Through tickets round the world by rail and steamer, are being arranged for by one of the leading eastern railways of the United States. The tickets are to be good until used, giving travellers opportunities to make excursions in Japan, China, the Holy Land, or wherever tourists may be disposed to leave the main line of travel. The prices are fixed from New York as far east as Alexandria, in Egypt, and west to Yokohama and Shanghai. An agent has gone out to arrange with the English steamship lines between China and the head of the Red Sea and the railway to Alexandria. The whole trip can be made within ninety days, and the entire cost will be at the utmost 1,200 dols. in coin.——The traffic receipts of the railways in the United Kingdom for the week, ending 11th February, 1870, upon a mileage of 12,544, amount to 736,314*l.*, being equal to 58*l.* 14s. per mile. For the corresponding week of last year the receipts were 701,107*l.*, the number of miles open 12,335, or 56*l.* 17s. per mile. A comparison of the two weeks shows an increase in the aggregate receipts of 35,204*l.*, and in the number of miles open of 209.

Artisans' Dwellings and the Co-operative Movement.—The annual *soirée* in connexion with the Artisans' and General Dwellings Company was held on the 9th inst. at Radley's Hotel, Blackfriars. The chair was occupied by the Earl of Lichfield, who said that by means of the co-operative movement, under which the society was established, it encouraged habits of providence, and enabled its members to obtain better houses and at a lower rate than they otherwise could. The Earl of Shaftesbury said the co-operative movement had taken hold of the people of England and the whole of the Continent of Europe, as well as of America, and Englishmen had the honour that the movement originated in this country. All classes of society were dependent on each other, and what was wanted in the present day was a grand union of the classes, with mutual respect, kindness, and succour. Lord Elcho thought nothing was better calculated to bring about a union of the different classes of society than the establishment of such societies as this.

The Accident at Abbey Mills Pumping Station.—In reply to Mr. Knight, at the Court of Common Council, Mr. Deputy Lowman Taylor, one of the representatives of the City at the Metropolitan Board of Works, said he had communicated with the engineer as to the cause of the accident at the pumping station, and had been informed that the air chamber, which was placed in the centre, was of cast-iron, and from some unexplained cause the air in it must have been exhausted, so that it received a shock direct from the pumps. The damage was in the course of being repaired, and steps were being taken to prevent any stoppage of the works should any accident occur in the future.

Proposed Public Building for Free Library at Nottingham.—At a preliminary meeting, convened by circular, held in the Museum, Wheeler-gate, it has been resolved to form a Public Free Lending Library, a Reference Library, Reading-rooms, Museum, Lecture-rooms, &c., for the town. An attempt will be made to obtain funds towards the building such an institution, to be vested in the town council for ever, and to be managed in accordance with the Free Library and Museum Act already adopted by the town. Donations are solicited, payable in quarterly or other instalments within one year, so that 1,000*l.* or upwards may be raised. A provisional committee was appointed.

Stained Glass and Symbolism.—The Bury Town Council is troubled about what has been termed a "Pope's window," which has been inserted in St. James's Church, without, it is said, the sanction of the Council. The dispute has been carried on between two Captains, one of whom thinks the church ought not to be disfigured with nonsensical Papistical symbols, the other that his brother captain and friends are unnecessarily punctilious.

Opening of a New Market Hall at Silverdale.—The opening of the new Market-hall at Silverdale has been inaugurated by a public dinner. The hall is a spacious brick building, standing in High-street, and the inhabitants are indebted to the private enterprise of Mr. William Steele of Madeley, at whose expense it has been provided. It is intended to be opened two days a week,—Mondays and Saturdays,—for market purposes.

Discovery of a Monument of a Biblical King of Moab.—A correspondent of the *Journal Officiel*, writing from Jerusalem, says,—"An archæological monument of the greatest importance has just been discovered by M. Clermont-Ganneau, interpreter to the French consulate here. It is a large basalt pillar, found to the east of the Dead Sea, on the territory of the ancient Moabites. On it is engraved an inscription of more than thirty lines, in Phœnician characters, commencing by these words;—'I, Mesha, son of Chamos.' . . . . . Now, Chamos was a King of Moab, mentioned in the Bible, and contemporary of the Prophet Elisha and Jehoshophat, King of Judah, and with Ahab, Ahaziah, and Johoram, Kings of Israel. . . . . The monolith relates the struggle of Mesha against the King of Israel, and enumerates the towns constructed and the temples raised by Mesha, and consecrated by him to the god of his nation at Chamos. The age of this monument is fixed by its synchronism with Jewish history: it dates from nine centuries before the Christian era, and from about 100 years after Solomon. It is nearly two centuries older than the celebrated sarcophagus of Echmonnazar, King of Sidon. The Phœnician characters in which it is written, present an Archaic aspect, not hitherto found to a similar extent in any of the Phœnician remains discovered. . . . . This precious text has just been sent to the Academy of Inscriptions by M. Ch. Clermont-Ganneau, with a memoir, which will be immediately published."

New Carving Machine.—In the machine invented by Mr. Gear, of Newhaven, U.S., the wood to be carved is fastened firmly to the bed by moveable clamps adjustable to suit any required size of wood, and the cutters are fastened to a spindle moved by a universal joint in any direction upon the bed of the machine. The cutter is guided by hand, the guide resting against the pattern. The carving can be gauged to any required depth, and made to conform to any required pattern. A fan blows away chips as fast as they are produced, leaving the work constantly in view of the operator. The same tool that cuts the mortise also cuts the tenon, the two pieces of work to be dovetailed being clamped together to the end of the table.

Sheerness.—The Victoria Hall and Public Rooms have been inaugurated. The style of the building is the pseudo-Italian Gothic of the day. The chief features of the plan include hall and restaurant, with refreshment, reading, smoking, conversation, library, retiring, and waiting rooms. There is a large concert-hall, 100 ft. by 53 ft., 35 ft. in height, with gallery, stage, lobby, corridors, and waiting and cloak rooms. The Victoria Hall will be one of the best rooms in the county for bazaars, concerts, promenades, entertainments, and assemblies of all kinds. The building includes a smaller hall, to be used as a Masonic lodge-room, to which preparation and ante rooms are attached.

The Open Spaces at the Mansion-house. At the last Court of Common Council, Mr. Deputy Fry presented a petition from the inhabitants of the ward of Walbrook in favour of the preservation as an open space of the piece of ground on the western side of the Mansion-house; also a similar petition from the president, council, and members of the Royal Institute of British Architects, who expressed a hope that the corporation would contribute a reasonable share of the expense of effecting this improvement. The value of the land was estimated at 180,000*l*. The petitions were finally referred to the Improvements Committee.

Panic in a Theatre.—During the performance at the Exeter Theatre last week, two men commenced to fight in the pit, and in the confusion which prevailed a cry of fire was raised. The building was densely crowded at the time. The audience in the pit jumped on to the stage, and a regular panic ensued. The officials and the more orderly portion of the audience, however, by strenuous exertion, ultimately succeeded in restoring order.

Royal Scottish Academy.—On the 10th inst., at a general meeting of the Royal Scottish Academy, Mr. W. M'Taggart and Mr. J. Dick Peddie were elected Royal Scottish Academicians.

Strike in the Building Trades.—On a proposal by Messrs. Alldin, building contractors, of South Kensington, to reduce their wages from 8d. to 7½d. per hour, the plasterers struck work, and declared the firm closed to the trade.

Newspaper Press Fund.—The half-yearly meeting of members of this fund was held at the offices, Cecil-street, Strand, on Saturday, the 12th inst., Mr. Godwin in the chair. The report of the committee for the half-year ending 31st December last stated that the institution is progressing satisfactorily, although it is necessary to reiterate the expression of regret, contained in the last report, that the number of members remains stationary. The roll-book of the society shows an aggregate of 238 members, of whom 167 are resident in London and its suburbs, and 71 in the provinces. Four members have died within the year, two of whom resided in London, and two in the country. To the widows of the latter liberal grants have been made. The grants, by way of relief, for the past half-year, amount to 77*l*., and for the whole year just elapsed to 147*l*.; the cases relieved being six in number. During the half-year the sum of 600*l*. has been invested in the purchase of 677*l*. 8s. 5d. in the New Three per Cents. The ordinary income of the fund for the year may be thus stated:—Dividend on 600*l*. Eastern Bengal Railway stock, 29*l*. 6s. 3d.; dividend on 700*l*. Great Indian Peninsula debentures, 34*l*. 3s. 9d.; interest on 3,800*l*. New Three per Cents, 101*l*. 9s. 7d.; from members' annual subscriptions, 162*l*. 18s.; from annual donations, 46*l*. 3s.; total, 374*l*. 0s. 7d. The total amount of receipts from all sources in the same period was 1,152*l*., and the expenses of administration, including salary, rent, office expenses, stationery and printing, postages, advertising, and cost of getting up the annual dinner, amounted to about 300*l*. Mr. Mould moved, and Mr. Charley, M.P., seconded, the adoption of the report. The chairman inquired what steps had been taken with reference to the plate recently engraved by Mr. T. Vernon from Murillo's picture of "The Pool of Bethesda," in the possession of Colonel Tomline, M.P., and which that gentleman had presented to the fund. The secretary, Mr. Taunton, stated that measures were being taken for the legal acquisition of the copyright by the trustees with the view of issuing the engraving to the public for the benefit of the fund.

The Burying-place of Abraham.—At a late sitting of the Berlin Archæological Society, Captain de Jasmund, the personal adjutant of the Crown Prince, gave an interesting account of a visit paid by his royal highness to the sepulchre of the Patriarchs, at Hebron, during his late journey to the East. The Crown Prince offered 100 napoleons for the necessary permission to enter the accredited tomb of Abraham, which no one had heretofore been allowed to enter. The Turks promised to admit the travellers on the following night, but it was unfortunately impossible for his royal highness to delay his journey so long. In the meantime, the Crown Prince and Captain de Jasmund gazed for a long time into the interior of the cave, through an opening 10 in. in diameter, until their eyes became accustomed to the flickering of the lamps with which it is lighted, and they were able to distinguish the form of the cavity. It is about 40 square feet in extent. The floor, which was strewn with written prayers cast in from above, had evidently been artificially smoothed. The whole space was empty, but at the further end an opening, closed by a latticed door, seemed to lead to the inner cave. No masonry was visible on the walls, and there was no sign of the fifteen steps and the pulpit which, according both to Rabbinical and Arabian accounts, are to be found in the sepulchre.

The Holborn Valley Improvements: Presentation to Deputy Fry.—A service of plate, worth 500 guineas, has been presented to Deputy Fry by the Court of Common Council as a mark of its high appreciation of his services as deputy chairman of the Improvement Committee throughout the erection of the Holborn Valley Improvement Works.

Royal Gold Medal of Architecture.—The Council of the Institute of Architects have nominated Mr. Benjamin Ferrey, F.S.A., Fellow, for the award of the Royal Gold Medal of 1869-70, subject to the approval of a special general meeting and to her Majesty's gracious sanction,

Somersetshire Archæological Society.—Subscriptions are being sought to place a memorial of the late Rev. F. Warre, a much valued officer of the society, in the parish church of Bishop's Lydeard. A monumental brass is proposed.

Training Ship for Poor Boys.—The Admiralty have consented to place at the disposal of the Board of management of the Forest Gate District Schools, the *Goliah*, one of the vessels now laid up at Sheerness, as a training ship for pauper boys. The Admiralty will fit up the vessel for 500 boys on the managers agreeing to pay 5,497*l*. The training-ship will be moored off Northfleet.

Architecture at the Royal Academy.—A special general meeting of the Institute of Architects will be held on Monday, the 21st of February, to consider the subject of a recent letter from Mr. S. Smirke, R.A., concerning the accommodation provided for architectural designs and drawings at the Royal Academy Exhibition.

Deptford Dockyard.—It is stated that Mr. Austin, an American millionaire, and the representative of an eminent shipbuilding firm, has agreed to purchase Deptford Dockyard for 140,000*l*.

TENDERS.

For the erection of County Court and offices at Gainsborough. Mr. T. C. Sorby, architect. Quantities supplied by Mr. John Scott:—

Ridal	£4,187 0 0
Nicholson & Son	3,997 0 0
Close & Co.	3,735 0 0
Dennett & Co.	3,674 0 0
Sherwin	3,459 0 0
Johnson	3,290 10 0

For semi-detached residence at Roehampton, Surrey, for the Right Hon. Earl Spencer. Messrs. Beeston, Son, & Brereton, architects. Quantities supplied by Mr. James Burnett:—

Parsons & Townsend	£1,183 0 0
Bracher & Son	1,125 0 0
Easton, Bros.	1,074 0 9
Adamson & Son	997 0 0
Wigmore	989 0 10
Aviss & Co.	969 0 0

For two detached residences, for Mr. R. Overton, Victoria Park, Leicester. Mr. J. Goddard, architect. Quantities supplied:—

Duxbury	£2,789 10 0
Fish & Son	2,786 0 0
Neale & Sons	2,739 15 0
Osborne, Bros.	2,640 0 0
Herberts (accepted)	2,600 0 0
Perkins	2,500 0 0

For finishing houses on the Pill-hill Estate, Bristol. Mr. W. Cloutman, architect:—

No. 1.

Millett	£474 0 0
Pady	340 0 0
Cleave	312 0 0
Lloyd	310 0 0
Harding	310 0 0
Hill	302 5 0
Stephens	297 0 0
Hook	289 0 0
Leat	285 0 0
Perkins & White	281 19 0
Hobbs (accepted)	269 5 0

No. 2.

Millett	£203 0 0
Perkins & White	183 17 0
Leat	175 0 0
Hill	172 3 0
Summons	170 0 0
Lloyd	160 0 0
Stephens	157 8 0
Hobbs (accepted)	149 15 0
Hook	149 0 0
Howell	146 10 0
Harding	100 5 6

For seven houses in Hare-street. Messrs. Reddall & Cumber, architects:—

Myers & Sons	£4,174 0 0
Carter & Son	3,595 0 0
Pritchard	3,594 0 0
Kiddle	3,478 0 0
Henshaw	3,468 0 0
Langmead	3,390 0 0
Ashby & Sons	3,386 0 0
Browne & Robinson	3,160 0 0
Higgs	3,151 0 0
Eaton & Chapman	3,123 0 0

For rebuilding four houses, Bell-street, Marylebone, for Mr. Barr, Curtain-road, Finsbury. Messrs. J. & E. A. Bull, architects. Quantities supplied:—

Ebb & Sons	£1,927 0 0
Wilson	1,922 0 0
Goodman	1,901 0 0
Merrian	1,900 0 0
Blackmore & Morley	1,864 0 0
Hockley	1,842 0 0
M'Lachlan	1,830 0 0
Wigmore	1,805 0 0
Brown & Sons	1,750 0 0
Kelly, Bros.	1,737 0 0
Scrivener & White	1,684 0 0

For reparations and building an additional kitchen to the Bath-street Temporary Infirmary. Mr. H. Saxon Snell, architect:—

Rist & Brown	£498 10 0
Patman & Fotheringham	494 0 0
Bridgman & Nuthall	437 0 0
Sabey & Son	430 0 0
Ennor	428 0 0
Perry, Bros.	427 0 0
Patten	398 10 0

For additional lavatories and sculleries to the Old Infirmary of St. Marylebone Workhouse. Mr. H. Saxon Snell, architect :—

Howard	£145 0 0
Crabb & Vaughan	135 0 0
Morsman	130 0 0
Longmire & Burge	127 13 0
Ebbs & Sons	125 0 0
Manley & Rogers	123 0 0

For the extension of the Brecon County Gaol. Mr. Thomas F. Fillary, architect :—

Hamer, Bros.	£10,110 0 0
Williams & Bolton	9,220 6 0
Watkins & Jenkins	8,795 18 9
Welsh & Son	8,700 0 0
Lovatt	8,578 4 4
Jones & Johns	8,478 0 0
Yates	7,997 15 0
Williams, Bros.	7,850 0 0

After reducing a large amount of labour upon all stone dressings, the two lowest were requested to revise their estimates, which finally came out :—

Yates	£7,473 11 0
Williams (accepted)	7,198 0 0

For the erection of Congregational Church and Schools at Acton. Messrs. J. Tarring & Son, architects. Quantities supplied :—

	Brick Facing.	Rag Facing.
Myers & Son	£3,739 0 0	£3,777 0 0
Hill & Son	3,690 0 0	3,720 0 0
Shurmur	3,628 0 0	3,727 0 0
Cowland	3,615 0 0	3,801 0 0
Adamson & Son	3,493 0 0	3,629 0 0
Dove, Bros.	3,430 0 0	3,605 0 0
Richards	3,394 0 0	3,692 0 0
Gibson, Bros.	3,339 0 0	3,493 0 0
Nye	3,313 10 0	3,449 0 0
Scrivener & White	3,186 0 0	3,447 0 0
Snowden	3,271 10 0	3,368 10 0
Shepherd	3,157 0 0	3,290 10 0

For erecting Congregational Church at Dawlish, Devon. Messrs. J. Tarring & Son, architects. Quantities supplied :—

Wilkins & Son	£2,641 0 0
Luscombe (Exeter)	2,625 0 0
Moass & Son	2,591 0 0
Trevena	2,372 0 0
Call & Pethick	2,207 0 0
Goss	2,109 1 3
Kenshole	2,036 9 0
Bragg & Dyer	1,980 14 3
Luscombe (Torquay)	1,853 10 0

Amended tenders for building at Leytonstone, for the Guardians of Bethnal-green. Mr. William Mundy, architect :—

Hill, Keddell, & Waldram	£2,802 0 0
Crockett	2,800 0 0
Marr	2,682 0 0
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Town-hall, Salford, 16th February, 1870.

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Borough of Tynemouth, 2nd February, 1870.

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Vestry Offices, 10th February, 1870.

The Builder.

VOL. XXVIII.—No. 1412.

A Recent Peep at the Great Pyramid.

IF the seven antique wonders of the world one only is still extant. The Pharos of Alexandria no longer sheds its light over the waters of the Mediterranean; Apollo Colossus has long since gone to the melting-pot; the crys-elephantine Olympian Zeus of Phidias has been turned into amulets and squared into dice; jackals labour the ground where once stood the terraced gardens of Babylon—the paradise of Nebuchadnezzar. The Temple of the Ephesian Artemis is sunk for ever in the marshes of the Cayster; the dethroned monarch Mausolus has taken refuge in England, and from his pedestal in the British Museum placidly looks down upon the remains of his celebrated sepulchre,—a monument of departed greatness. But the Pyramid of the Cheops still stands erect on the western bank of the Nile. The storms of forty or more centuries have but chafed its surface; and though the palaces of Cairo have been partly built out of the stones of its *revêtement*, yet it remains apparently uninjured, and is likely to remain to the end of time. Climate, no doubt, has had much to do with its wonderful state of preservation. Had it been built in a country with cold and damp atmosphere, the moisture would have penetrated between the joints, and the frosts and thaws uplifted and riven its enormous courses of stone, as in northern climes they rive the granite mountains; but in Egypt, where literally there is no rain, no damp, no frost, Time has not these slaves to help him in his work of destruction.

Such an ancient monument as this, which existed before Abraham went down into Egypt, has been necessarily described by many writers. We have in our possession a book, called "Les Plantz des Villes," published in 1573, which contains a medley of good things. Poictiers, "the city of Peru," and the Pyramids are all therein described and illustrated, and we borrow from it a list of the writers of antiquity who have touched upon the pyramid, viz;—Herodotus, Duris of Samos, Aristagoras, Dionysius, Artemidorus, Alexander Polyhistor, Butorides, Antisthenes, Demetrius, Demoteles, and Apiori; and we are also informed that Thalis, of Miletus, obtained its height by measuring its shadow at the proper moment. Heredotus, perhaps, gives the most complete account. He tells us that the Pyramid of Cheops was built in twenty years by 100,000 men; that they commenced by constructing a road from the Nile, of polished slabs of stone, ornamented with figures, for the transport of the stones. He mentions a canal formed by Cheops, in the midst of which was an island and a chamber, and he describes also the manner in which the outer covering (which was smooth) was laid. He says that upon the steps (those formed by the courses) were raised machines of timber,—evidently including inclined planes,—by means of which the huge stones of the casing, 30 ft. in size (they were triangular), were raised stage by stage to the summit, which was completed first, and the work continued downwards to the basement, this being evidently the only manner in which the work could be accomplished. In addition to these ancient writers, we have had in more modern times dissertations by Le Brun, Grobert, Jomard, Meister, Hirt, De Sacy, Langles, Belzoni, Lepsius, Howard Vyse, and, though last not least, Piazzi Smith, who has compassed and spanned every stone, so to speak, of the Great Pyramid, and written an exhaustive book upon the subject, to which we beg to refer every one who wishes to study it in a serious manner.

Our object is simply to describe the impression made upon ourselves during a day's visit to it, in the belief that however frequently it has been spoken of, and however often it has been visited, a vast structure somewhat about the size of Lincoln's-Inn-Fields at its base, and somewhat higher than the cross of St. Paul's, which existed when the world was in its cradle, and will in all probability accompany it to its tomb, can never be considered commonplace, hackneyed, and uninteresting.

We left our hotel in the Esbekiah, Cairo, in a carriage before daybreak, accompanied by two Americans, who had joined us at Jaffa,—a fat doctor and small minister. Half an hour's drive brought us to the banks of the swollen Nile at Old Cairo. Here the donkeys and their drivers, who had been convoked by our dragoman, joined us, and we embarked in a caique at a spot which some have called Charon's Ferry, possibly because, in the time of old Egypt, bodies were here embarked on their way to the necropolis. Our Charon did not, however, bid us "trim the boat and keep quiet," but he himself was trimmed and kept quiet by our dragoman, for, as he demanded more than his obolus, our man felled him like an ox. He then arose, shook himself, and became a wiser if not a better man. In this we obtained a striking confirmation of the sad truth which we had learnt in our previous dealings with Orientals, which was, that if you wish to gain your point with either pasha or peasant, you must prostrate him, morally first, and then demand the favour of his compliance with your request that he will do his duty or perform his contract. On board the caique, in close companionship with us, were our favourites, Ginger Pop and Yankee Doodle; the former was a white donkey, of sturdy build, very like the one that figures in a picture by Gerome which will occur to the recollection of some of our readers. He derived his name from the fact that as he had made the pilgrimage to Mecca he had received the distinctive badge of a hadji, by having his mane and tail dyed with saffron, till they were the colour of ginger. He fell to our lot, and we mounted him on reaching the opposite bank with a certain degree of pleasure, for we knew by experience that he was a trustworthy steed. Yankee Doodle fell to the lot of the fat doctor, who to revenge himself upon those who had named his beast, beguiled the way by persuading his driver that his donkey would never be in want of a rider if he changed its name to Lord Dundreary; and by the time he reached the Pyramids, by dint of constant repetition, the boy had got the name pat.

Our ride was a pleasant one, not in a straight line to the Pyramids, which we saw always before us, but, as the waters were out, by various turnings and windings on dykes and causeways, which, in the time of the inundation, served as the roads of communication between the various villages that crowned the summits of mounds rising out of the water on both sides of us. Each mound had its grove of date-palms; its group of white flat-topped houses; its crowd of fellahs, of fellah women in blue smocks and black nose-bags, called veils; and its naked children—like animated bronze figures, with the delicately-moulded forms peculiar to the dark-skinned races—sporting in and out of the shallow water, evidences of the exuberant life with which the Delta and that part of Egypt swarm.

After passing many of these picturesque oases, by about noon we began to ascend to the rocky platform on which the Pyramids are situated. Before we had reached it, a swarm of swarthy Arabs swooped down upon us, yelling and gesticulating, and seized our bridles. After recovering from our first surprise, we were reassured by finding that, though their manners were rude, their language was refined. To be accosted in our mother-tongue, spoken with a perfect accent, by a troop of dirty savages, was something novel for the lower class of Levantines, who, when they do speak a little English, generally interlard their discourse with expressions which they have picked up from sailors,—not exactly pleasing to ears polite. These men, on the contrary, had gathered their vocabulary from the hundreds of educated men who had visited the Pyramids on their way to or from India. Hence the amusing contrast. Still, however satisfactory their accent, it was not agreeable to be unseated by half a dozen pairs of unwashed hands. So there were loud calls for the Scheik, who, after preliminary conversation, by dint of loud persuasion, combined with force, prevailed upon his followers to leave us unmolested to choose our own guides.

We have mentioned hitherto but one pyramid, that of Cheops, as it is the largest and best-preserved of all; but pyramids of all sizes are to be found at intervals on the borders of the Nile, between the Delta and Jayoum, and always on the western bank only. Lepsius visited sixty-seven within a distance of thirty-six miles. At Ghizeh there are three large ones, and the remains of six diminutive ones at their feet. It has been affirmed, to account for these different sizes, that each monarch began to build his tomb as soon as he ascended the throne, and that he added a course or two to the exterior every year of his reign, and that in this manner the size of the pyramid is an evidence of the length of the reign of the monarch who built it; but this could hardly have been the case, for Cheops reigned sixty-three years, while Herodotus, who must have gained his information from the traditions of the priests, asserts that his pyramid was built in twenty years.

Besides those of Ghizeh, there are groups of pyramids at Sakkara, Abourouel, Abousir, Dashour, Matanyeh, and Meidoun. All are on the same plan, with an internal chamber for sepulture, the entrance to which has been concealed by the external masonry, and all are in a more ruinous state than those which we saw at Ghizeh.

During our approach to the Pyramids from the Nile they grew so gradually upon our sight that we could hardly realise their vast dimensions until we got near enough to see some individuals belonging to a party which had preceded us descending at one of the angles, in proportion to the mass like mites to a Cheshire cheese. Leaving our donkeys in the shade, we hurried to one of the angles, where the ascent is easier than elsewhere, and commenced our pilgrimage to the summit. Two Arab guides are allotted to a man, and three to a lady; they keep hold of your hands, and by dint of hauling and

pulling (for the courses forming the steps are, in some places, 3 ft. or 4 ft. high), contrive to land you, puffing, panting, at the summit, if you do not give in by the way. Our fat doctor gave in at a third of the height, the lady who was with us at three-fourths, and the short minister and ourselves reached the summit—a platform of about 30 ft. square—in safety. Here we sat down to recruit and enjoy the glorious prospect, of Cairo and the Nile on one side, and on the other the reddish waves of sand, stretching as far as we could see towards the desert of Jupiter Ammon. Near us were the two other pyramids, those of Cephrenes and Mycerinus, beneath us was the rocky necropolis, full of indentations and irregular cuttings, marking the site of excavated tombs, and a little beyond, on a lower level, appeared the head of the Great Sphinx.

While we rested, the conventional Arab performed the conventional feat of running down one pyramid and up another, for the gratification of a slight *baksheesh*. The ascent of the second pyramid must be difficult; as the outer smooth casing in part remains; but he accomplished the feat in less than ten minutes. We then prepared to go down. This was an arduous and somewhat dangerous undertaking, as the treads are generally very narrow, and are half-covered with rubbish. You are completely at the mercy of your guides, who hold you by each hand, and take a delight in compelling you to acts of agility, which, when you are middle-aged, slightly inclined to *embonpoint*, and have not the sure footing of a goat, are in a slight degree distressing, particularly when you know that one false footstep would be sufficient to roll you to the bottom and convert you into a modern mummy. Our fat friend was so fully impressed with the idea of this risk, that he had actually promised his guides the unheard-of *largesse* of five shillings if they would deposit him safely on the sand below; consequently, on gaining the ground, we found him a general favourite, attended by a crowd of Arabs, who evidently thought him "soft" as well as fat. He had suddenly become the hero of our party, and we who were not so liberally inclined were constantly reminded of his indiscretion by such speeches as this: "It is customary to give poor Arab more than the ordinary *baksheesh* given to Scheik. Fat man very good man; he give poor Arab five shillings." In fact, he had created a complete revolution, and had spoilt the market for future visitors, as we subsequently learnt from one of them at the *table d'hôte* of our hotel. There are upwards of 200 courses, varying from 4 ft. 4 in. to 20 in. in depth in the Great Pyramid. Herodotus states that the outer casing was ornamented with carved figures, probably hieroglyphics.

After a hearty luncheon, we prepared for the second act—a visit to the interior. We found the entrance a little above the level of the sand, and in the middle of one side. Here we each took a lighted candle or torch, and entered, stooping and crawling as we found best, a passage, 4 ft. square, which descended gradually at an angle of 25 degrees. We could not stop to examine the construction of this gallery, as we were preceded and followed by Arabs, who urged us on; and as the suffocating closeness of the atmosphere, joined to our uncomfortable position, made us anxious to get into some more commodious portion of the building. After descending for a few minutes, we commenced to ascend at the same angle, and at last reached a deep well in our path, which served as an approach to the lowest chamber, which is seldom visited. Beyond the well we entered a higher gallery, where we had more breathing room. It was about 24 ft. high to the top, and was covered by a horizontal arch, *i.e.*, one composed of stones corbelled out on both sides till they meet, the ends being cut away so as to present internally two sloping sides. This gallery ascended at so sharp an angle, that it would have been difficult to walk up if holes had not been cut here and there in the polished floor for one's footsteps. It was about the same width as the first passage. At the top we entered by a vestibule into the King's Chamber, containing the sarcophagus of Cheops, the founder of that stupendous structure. This chamber is about 34 ft. by 18 ft. in dimensions, and is roofed over by flat slabs placed side by side. The sarcophagus is of porphyry, and is covered with hieroglyphics; as the pyramid has been built round it, fortunately, it cannot be removed entire, and so possibly it may be allowed to remain, to rejoice the eyes of generations of travellers. As soon as we reached the chamber, the Arabs began to howl and dance, for the gratification of their fat benefactor, what appeared, from their dusky figures, grinning faces, wild shouts, and whirling torches, a regular *ronde infernale*. The heat and closeness were suffocating, as may be imagined would be the case in an upper chamber in the centre of the pyramid, to which there was no opening except by a considerable descent, so that the air cannot have been renewed except by chemical change since the time of the Pharaohs. We were, therefore, not sorry to emerge into the open air, for we knew that there was nothing about the construction of the pyramid that we could not learn from books, as it has been so frequently measured and illustrated.

Our last visit was that made to the Great Sphinx, whose head and shoulders only are now visible above the ever-encroaching sand. She is no beauty, as her face was remorselessly ruined by a fanatical scheik in the fourteenth century. Her nose has disappeared, but the firm projecting under-jaw remains; and this, together with her retreating forehead, combines to offer a type of that deformity which was so attractive to certain Pre-Raffaellites, who copied vulgarly the early eccentricities of their now-reformed leader. If the sphinx were uncovered, she would be a marvel hardly second in interest to the Great Pyramid, as she measures 150 ft. from the extremity of her extended paws to the root of her tail; and, moreover, she holds between her fore-paws a temple, in which divine honours were paid her. The entire figure is cut out of the rock on which the pyramids stand,—all deficiencies being made good with masonry. Amongst the conflicting theories about Egyptian chronology, it is difficult to fix the exact date of the erection of the Pyramid of Cheops, but we know that the Sphinx was completed in the time of Thothmes IV., who reigned in the year 1561 B.C., so that in all probability it was constructed many centuries after the Pyramid.

The point chiefly to be noticed in the Great Pyramid, besides the wonderful harmony observable in its dimensions,—for a correct understanding of which the before-mentioned book of Piazzi Smith should be carefully perused,—is the occurrence of the first example of the horizontal arch, which was borrowed from the Egyptians by the Greeks, and employed by them in the Treasury of Mycænæ; the gates of Assor; at a later period in the Fountain of Hippocrates, in the Island of Cos; and in the Mausoleum. It is also to be remarked that its external form was adopted by other nations as the distinguishing mark of a sepulchre. We find that not only was the magnificent tomb of Mausolus surmounted by a pyramid, but that also smaller sepulchres, such as that of Theron, at Agrigentum; the Lion tomb of Cnidus, the monuments in the Valley of Jehoshaphat, and many of the Roman tombs in Africa, had also pyramidal roofs. And may we not trace the steeple of St. George's, Bloomsbury, and all magnificent *perrons*, even that of the Prince's Monument in Hyde Park, to the same remote source, however indirectly they may have been derived from it?

THE ARCHITECTURAL EXHIBITION.

THE honorary secretaries of the Architectural Exhibition Society have sent out a circular to the leading members of the profession, and to the societies representing the profession, of architecture, in town and country, calling upon them for more efficient aid and contribution to the Exhibition, both in the form of drawings to be exhibited, and in the more solid and perhaps less attainable shape of money subscriptions. Unless this desired assistance be more liberally given than heretofore, and a greater general interest shown in the success of the Exhibition by those most concerned in its success, namely, the architects of this country, it appears probable, according to the circular referred to, that it cannot be continued after the present year. Whatever difference of opinion may have existed as to the real importance of the Architectural Exhibition hitherto as an exponent of the state of architectural art in the country, and a means of extending the knowledge and appreciation of architecture among the general public, there will probably be few of our readers who will not concur with us in thinking that the discontinuance of this Exhibition for want of the support asked for would be a sign of a very undesirable move in a direction in which none of us individually wish to travel,—backwards.

It may be said that as the Royal Academy have announced their decided intention of keeping one room in their new building for architectural drawings, provided a sufficient number of good drawings be sent to fill it; or, at all events, to give in that room the preference in position to architectural drawings over others, that a special exhibition for them becomes superfluous; and that it is far better for the profession, those of them who have anything worth exhibiting, to concentrate their forces in one place, more particularly when that place is one to which, at certain seasons, numbers of people congregate, and where indeed it is not quite the right thing *not* to go. And, no doubt, to hang architectural drawings in one of the Royal Academy's rooms in the full fever of the season does insure a greater number of people seeing them and passing them than perhaps any other means; and it may be as well that the Academy, who number architects among their body, should openly give their recognition of architecture as an important art, and that there should be a chance that some of the large majority of visitors to the Academy, who know and care absolutely nothing about architecture, should have their interest awakened by some cunningly-prepared drawing, and that those who come to scoff should remain to praise. But to this possible advantage there are important drawbacks. In the first place, architectural designs exhibited in the form of drawings do not stand on the same ground as the rest of the works in an exhibition like that of the Royal Academy. The paintings, water-colour drawings, sculptures, there ranged are works complete in themselves, and which have attained their purpose and end; but an architectural drawing is merely a representation, in a very imperfect way, of what the architect (or his draughtsman or colourist) thinks will be the effect of the work if executed, unless we except the cases in which the drawing represents what the architect knows will not and cannot be the effect of the actual building. Here, then, is the architecture at a double disadvantage. If the exhibitor makes his drawing really an architectural drawing, such as an architect might find it worth his while to study with the view of arriving at a key to the structural and æsthetic design of the building represented, it is evident that this drawing must be looked at from quite a different point of view from the drawings and paintings which form the bulk of the collection; that its merits, if any, will be of a perfectly different kind; and that it will have to be considered as a means, not as an end. But it is idle to expect that the public who throng the picture-saloons of the Academy in May and June will draw this distinction when they enter the Architectural Gallery. Not one person in a hundred, probably, goes to that suite of rooms with a view of taking a thoughtful and critical pleasure in works of art; they go to see pictures, some of which interest, some amuse, and some puzzle, them; and the architectural gallery, filled (according to our present supposition) with what look to them more like diagrams than paintings, will merely be passed over as a blank break in their chain of sight-seeing, suggesting nothing to them. If, on the other hand, we keep to the practice which caused so much comment among the French architectural critics at the time of the Paris Exposition, of making our architectural drawings only a series of picturesque views, we have then to put them in competition, as *pictures*, against the other attractions of the Exhibition-rooms, with what kind of result may be easily foreseen. An architect can rarely afford to employ a really first-rate artist to make his design into a picture for him (even if the first-rate artist would undertake the job); besides which, the necessity for showing clearly the details of the building, and making it predominant, and everything else in the drawing only accessory, of course militates against artistic effect. So that we have no choice at the Academy, save either to be passed over by the mass of spectators as unintelligible, or to be made light of as inferior to the other works of art in the same building. Add to this the comparatively small scale and minute detail of most architectural drawings, which must of course give them an insignificant effect alongside of large and powerful oil-paintings or water-colour drawings, and it will be seen at once how impossible it is that the ordinary run of visitors to the Academy will give any intelligent attention, or any attention worth having, to the architectural drawings occupying a corner gallery of the building to which they have come for pleasure or study of a totally different kind.

Such considerations are, we imagine, sufficient to show the eligibility, even the necessity, for a separate exhibition of architectural drawings, where these initiatory representations of architectural design can be viewed and studied upon their own proper basis, apart from the distracting influence of works of art of a wholly different nature. And there is probably scarcely any architect of talent or eminence, in town or country, who, if the question were directly put to him, "Do you consider an architectural exhibition necessary or desirable?" would not immediately answer in the affirmative. One provincial society, that of Liverpool, has already, as our readers will have seen in our last number, expressed its opinion decisively on this head, in a resolution passed at a general meeting of the members; and assuming, as we think we may do, the existence of this general approval of the scheme, it is somewhat surprising that the Exhibition Society should be suffered to be now, after a career of some years, in a position to feel compelled to solicit the support which it might have been thought the architectural profession at large would before now have thought it their interest to give to them. That this is so is, perhaps, partly traceable to a certain laziness and "save-trouble" feeling among individuals of the profession. A would be glad enough to hear that there was a good exhibition, but he cannot be troubled to pack up and send off drawings for it, still less to make a drawing on purpose to exhibit: he thinks B, who got that town-hall competition, ought to send up something; but he has not time himself to think about it. We have heard exactly this said more than once; and if the object were to fill the walls with designs for very large and grand works, this would be a valid objection; for few architects have the luck to get a really grand commission to carry out.

But we want to know how small things are getting built, and how they should be built, as well as large ones; and a design for an ordinary-sized dwelling-house, which shows originality and refinement in plan and conception, is more valuable than the most astoundingly impossible perspective view of a town-hall where these qualities are absent. It is the bane of the system of architectural competitions that architects get, through them, into a habit of only wishing to astonish spectators by dint of mere bigness and splashiness of drawing. An exhibition where the chief critics would be professional men, who can see into the real worth of a design, and are not to be taken in by draughtsmen's dodges, ought to be a great corrective against this evil. It is to be feared, however, that the reason why many who might contribute to the architectural exhibition do not, is, that it does not "pay;" that the drawings are not sufficiently known and seen by the public; and that, in fact, the exhibitors cannot trace many commissions as having arisen from the display of their works in the room in Conduit-street. This, if a somewhat narrow, is still not an unnatural feeling; and it is certainly to be regretted that the architectural exhibition has attracted so little public notice generally, on the part of those not directly connected with the profession. The very great ignorance of even educated people as to what constitutes architecture as an art, and their consequent want of interest in and comprehension of the drawings which illustrate it, is, of course, mainly the cause of this indifference; and it will take a long time, and a much better system of art education in our schools, to do away with this stumbling-block.

However this may be, we do not think that in the meantime the architectural profession of England ought to allow the exhibition to drop, because the general public do not show so much interest as they might (and, we may add, *ought*) to show in it. Taking a serious view of the profession of architecture, involving the solution of many difficult problems, artistic and practical, which concern the beauty and well-being of our towns and villages, so great is the advantage and instruction to be gained by architects from a knowledge and study of the works of their contemporaries, at home and abroad, and from knowing in general what is going down and what is coming up in their profession, that it is worth while to make a stand for an exhibition which will give us these advantages; and this the Architectural Exhibition may certainly be if it is generally supported and contributed to as it should be. In the present state of public non-interest in architecture, it is, indeed, next to impossible that such an exhibition should be self-supporting, and, perhaps, this is the most difficult part of the matter; "the penny-fee will be a hard chapter, we doubt." But if even one-fourth of the architects in this country would make up their minds to subscribe something towards the necessary expense of keeping up the Exhibition, the amount requisite from each for this purpose would, probably, be something quite trifling, and of scarcely any account at all in comparison with the importance of the object. One word may be added as to what ought to be the nature of the drawings to be exhibited. It is not entirely without cause that we have been twitted by some French critics with caring for nothing in our architectural drawings but the making of pretty pictures. It may be said that this is the only form in which non-professional people care to look at an architectural drawing at all. The sooner they are taught differently, then, the better. But the exhibition will not, at all events for the present, be for non-professional visitors, but mainly for architects. Let it then be made such an exhibition as architects can really visit with advantage, and derive some instruction from with regard to each other's mode of working. Small perspective sketches are all very well, if honestly done, to show the architect's idea of what his building should look like in execution. But the magnificent views and vistas which confound the minds of competitive committees are out of place in a professional exhibition. We know they are all humbug, and it may be necessary to indulge in a little of this sometimes to please clients; but there is no reason why we should flourish it in each other's faces. What we want are drawings and plans which will enable us to trace out the whole working of a design; and especially large-sized and careful drawings of portions of a building, wherever anything special, either constructive or artistic, has been attempted, would often be very valuable for study, especially by young students. Let us be assured of an exhibition, in short, that will be of real value to professional visitors, and we trust there will be found among the architectural profession of this country sufficient *esprit du corps* and love of their art to induce them to give it a cordial and substantial support.

CLAUSES IN THE IRISH LAND BILL OF INTEREST TO THE BUILDER.

It does not fall within the scope of our columns to enter into any general discussion of that extensive and complex measure, the main features of which were laid before the House of Commons on the 15th inst. Dealing, as it purposes to do, with the main question of the tenure of land in Ireland, its probable advantages or disadvantages involve many considerations that are foreign to our pages. But there is one point on which our readers may naturally expect that we shall not be altogether silent, and that is the probable and purposed effect of the Act, should it become law, on the operations of the builder.

The proposed provisions of the measure, in this respect, are capable of ready and distinct definition. It is a common practice in Ireland—and Mr. Gladstone expressed the surprise that he felt on becoming aware of the fact—although not in England, to value the buildings on a farm apart from the farm itself. That practice increases the facility with which any improvements made by a tenant in the form of permanent buildings, can be estimated. It is the intent of the measure to increase the security of the occupier of the land, and to render difficult and costly eviction on the part of the landlord, except in case of non-payment of rent. Certain rules of compensaion for such evictions are laid down; but, in any case, it is proposed to recognise the right of an outgoing tenant to payment for permanent buildings erected by him, if they are applicable to agricultural purposes, and if they are such as to improve the letting value of the property. It is necessary that such additions to the holding should be suitable for the purposes of agriculture, as, otherwise, they would not come within the scope of the tenancy. Thus a case was cited in which the tenant of a farm abutting on the sea-shore built a bathing-house, and claimed to be paid for it as an improvement. Such an outlay would not come within the provisions of the present Bill. It is quite clear that it would be unjust to saddle the landlord with a payment for any building which was altogether apart from the terms of the contract for occupancy, and which, although serviceable to one occupier, might prove useless to another.

The onus of proof as to the authorship of such structural improvements—to which the Bill proposes to assimilate the case of the reclamation of land—is thrown upon the landlord. That is to say, if the tenant claim to have erected a certain building, it is for the landlord, if he dispute the claim, to show that it has not been erected by the tenant. On the one hand, of course, the building will be to the fore to prove its own existence. On the other hand, it is presumed that the landlord will have, or ought to have, proper plans and surveys of his estate, which he can produce with all necessary books and records, so as to show that the improvements which the tenant claims to have effected were in existence at a date prior to his claim.

It is further provided that respect must be had to any advantages already derived by the tenant from improvements which he has effected on his holding. It is not easy to see how this provision applies to the case of permanent buildings erected by the tenant at his own cost. If his rent has been raised in consequence of such improvements effected by him, he will have paid twice for them, once in the interest of the money laid out, and once in the increased rent. The opposite case, of an abatement being made in rent, in consideration of permanent buildings being erected by the tenant, is not likely frequently to occur. In that case, no doubt, he would, altogether or in part, have recouped his outlay. It can hardly be urged that the general principle of such compensation is unjust.

A farther provision which touches the subject of domestic building is that which allows of the sub-division and sub-letting of land by a tenant for the purposes of cottages and gardens. It is proposed to allow of such sub-division for the use of servants employed upon the farm, or for agricultural purposes. Into the general question of the policy of the case we cannot enter. It is, undoubtedly, proposed to limit, or rather to confiscate, certain rights which the owners of land have hitherto considered to attach to proprietorship. It is not, however, certain that such a limitation would be a positive grievance to the proprietors. In a merely financial point of view it is possible that it may be to their advantage.

But it is clear that the tendency of this portion of the measure would be to encourage domestic building in Ireland. A tenant would often be disposed to make substantial improvements in his holding, if once he had the assurance that the money he thus laid out, so far from giving the landlord a firmer hold on his rental, would not, in any case, be absolutely lost to the family of the improver. The tendency would be good in two ways. It would lead to the erection of convenient buildings, which otherwise would be deferred or avoided, and it would lead to the more workmanlike and permanent finish of the buildings so erected. In a country for the most part rich in excellent building materials, the hope of compensation would favour the transformation of the straw-thatched, clay-built hut, into the neat stone-built cottage or outhouse. The transformation which the last twenty-five years have effected in many English country villages is marvellous. Neat cottages, often with architectural pretensions of no mean order, are to be found replacing the old huts, partly timber-built, partly plaster, partly rubbish of any description, with windows the size of pigeon-holes, thatched roofs, and no means of ventilation, and which look so picturesque in pencil sketches. Those who are familiar with Ireland will know how much room exists for improvement in this respect. Our own experience is not such as to make us sanguine as to the rapid effect of legislation, even supposing it to be guided by as much wisdom as is competent to parliamentary legislators, in changing the long-formed habits of a race. Still, it is one thing to strive to enlist human nature on the side of progress, and another thing to ignore its well-known motives. In proposing to give the builder compensation for the work of his hands we trace at least a possible rudiment of increasing civilisation.

The rental of Ireland, it is well here to place on record, was estimated in 1779 at 6,000,000*l.*; in 1869 it is returned at 12,000,000*l.* The rental of England in 1771 was estimated at 16,000,000*l.*; in 1869 it is returned at 48,000,000*l.* The rental of Scotland in 1770 was stated at 1,200,000*l.*; in 1869 it was 7,200,000*l.* Thus, during the same period of time, speaking in round numbers, rents have doubled in Ireland, trebled in England, and sextupled in Scotland, the term selected being that

of ninety years. It will be a matter of interest to compare the increase of population, and the augmentation in the size of the capitals and great cities of manufacturing and commercial industry, with this increase in rent. The rate of increase of London, for instance, is known: it doubles in a little less than forty years. On the other hand, the constant decrease in the value of money, which has been so much accelerated since the discovery of the Californian and Australian gold-fields, has to be set off against the nominal increase in rental. The subject is one on which the materials for exact comparison have yet, to some extent, to be collected. It is closely connected with the question of the improvement of the habitable nature of the country, the sanitary, civilising, and æsthetic progress of domestic architecture.

We have confined ourselves to an examination of that portion of the Bill now before Parliament which distinctly interests the architect and the builder. But a lesson is involved in the statement incidentally made by the First Lord of the Treasury in introducing this important measure, of which we ought not to lose sight. We have, not unfrequently, had occasion to warn our readers against the exaggerated and pedantic application of rules which, while sound up to a certain point, prove altogether fallacious when they are relied on as main and normal laws of social conduct. Human nature is more complex, as well as more noble, than either the pence or the multiplication table; and no error can be more lamentable than that which leads to the attempt to weigh all human nature in the partial and restricted balance of finance. The correlation of supply and demand is an important truth, and one which can not be neglected without producing certain and appreciable evils. We are even now smarting from the neglect of this law in the premature construction of railways, which were supplied, for the benefit of the individuals interested in their construction, in the absence of any such real demand on the part of the public as might justify the outlay.

But to attempt to apply this rule as adequate to meet all the exigencies of a complex state of civilisation is a miserable and mischievous pedantry. It is this fact which is so distinctly illustrated by the Irish returns quoted by Mr. Gladstone. It is undeniable that one main cause of the Irish trouble is the fact that cultivation of the land is almost the sole national industry, if, indeed, it be allowable to use the word. With the exception of parts of Ulster, almost the whole support of the Irish people is derived from agriculture or pasture. The mining, metallurgic, textile, commercial, and other occupations which are carried on by so large a proportion of the population of Great Britain, are, in Ireland, chiefly conspicuous by their absence. The oat-field or the potato-ground, — such is almost the sole resource of the great majority of five millions and a half of Irishmen. It results from this fact that the competition for land is keen. Independently of the strong passion for the native soil, which forms a predominant feature of the Irish character, land has a value in the eyes of the ordinary Irishman far greater than is the case with the Englishman on the same social level. In fact, the occupancy of land is, for the most part, the sole means by which the former exists.

Demand for land, therefore, is at a maximum in Ireland, as compared with England. Supply, on the other hand, is limited and fixed. On the principles of political economy, therefore, the price of land,—that is to say, rent,—ought to increase in Ireland in a ratio far more rapid than is the case in Great Britain. And with this increasing rental every inducement to the economical, industrious, remunerative use and culture of land must, theoretically, concur. In some parts of the world we know such to be the case. We may cite China as an instance. There the ratio of population to land is very large, and there the utmost ingenuity and industry are exercised to obtain the largest returns from the coveted soil.

The facts quoted by Mr. Gladstone, however, are at total variance with a theory which must be true if the rules of political economy were those which regulated human action. The case of Ireland is absolutely the reverse of that which ought to prevail, did the correlation of supply and demand settle all social questions by a self-operating influence. During the period which has witnessed the tripling of the rental of England, and the six-fold multiplication of that of Scotland, that of Ireland has only doubled. The rich stream of productive industry which has been turned into so many channels among ourselves has indirectly increased the value of landed property. The mere fact that land was in demand has altogether failed either to enhance its price or to improve its culture, to an extent at all comparable with the result of what may be called the contagion of industry.

The actual ratio of land under corn crops per head of population does not differ very sensibly in the three kingdoms. In Scotland the proportion is 2·31 mouths per acre, in England 2·61 mouths per acre, and in Ireland 2·56 mouths per acre. But the proportion of sustenance derived from the potato is far larger in the latter country, where a million of acres are devoted to the culture of this root. The actual facts are highly instructive.

England contains 32,590,397 statute acres, of which 22,261,833 were under cultivation in the year 1866, about a third being under corn crops. The population in that year was 11,461,217.

Scotland contains 19,639,377 statute acres, of which 4,158,360 were under cultivation in the year 1866, about a third being under corn crops. The population in that year was 3,153,413.

Ireland contains 20,322,641 statute acres, of which 15,549,796 were under cultivation in the year 1866, less than one-seventh of which were under corn crops, two-thirds being permanent pasture. The population in that year was 5,571,971.

In England, therefore, there existed 2·8 acres of land, of which 2·00 acres were cultivated for every soul of the population. In Scotland there existed more than 6 acres for every individual, although only about 1½ acre per head was under cultivation. In Ireland there were 3·6 acres, of which nearly 2·8 were cultivated per head. It must be stated, however, that in the case of Ireland, the hill pastures are included in the returns, which is not the case in the English statement. Half of the land cultivated in England is devoted either to grass crops or to permanent pasture. In Ireland 11½ millions of acres out of 15½ millions are pasture and grass crops. Thus, while the English population cultivates about an acre per head for corn, green crops, and fallow, the Irish population cultivates only about two-thirds of an acre per head for these purposes, while about one-fourth of the area of the island lies permanently waste.

The above figures are ample to show that those who endeavour to account for human action on the simple principles which regulate purchase and sale, or supply and demand, take a view of a large subject so inadequate as to be properly designated as puerile. While the Irishman, who depends solely on land, has a third less land, for every mouth, to cultivate than has the Englishman, who leans on so many other industries for support, the return which he wins from his culture, measured by the secular increase in the rental, is as two to three when compared to the English rental return. The comparison with Scotland is even more striking. The climate of that kingdom is more severe than that of Ireland. With the exception of the valley of the Clyde, the aid to be derived from her agricultural industry is not to be compared with that afforded by the great mineral wealth of England. But the high moral character of the Scotsman, his patient forethought and untiring industry, are made evident by proof stronger than any words that we can employ. While cultivating less than a fourth part of the area of his mountainous country, a breadth of land which is, as in the case of England, about equally divided between pasture, whether permanent or annual, and crops chiefly useful for human sustenance, he tills for human support about the same area per head as does the Irishman. Yet the results of his industrial toil, in the course of nine-tenths of a century, as measured by the increased value of the rental, is just threefold that which has been attained in the more favourable climate from the more fertile soil of the Emerald Isle.

It is undeniable that moral causes must have no small influence in producing such various results of national activity. To neglect or ignore the genius of a people, or of a race, is as unphilosophical as to neglect the conditions of soil or of climate. And the error is not one of theory alone. Were it so, we should find little disposition to discuss it. It enters into the very life of a people. It influences the course of legislation, no less than that of administration. Mr. Gladstone prefaced his motion by the discouraging doubt whether the main features of legislation for Ireland since 1793 had not tended rather to injure than to improve the condition of the Irish people. He admitted the existence, under identical laws, of a state of custom and habit so different in the two kingdoms as to amount to disparity of law. The gist and upshot of the whole matter is, that it is not legislation to which we must look for the sole, or even the main, sources of improvement. Laws, in their operation, if not in their origin, are the reflection of national character. Let law be amended, if reason demand it; but let us not expect, from any alteration in the statute-book, that national progress with reference to which law bears little more than a negative relation. We may remove injustice; we may remove obstacles to agriculture, to industry, to commerce; but such removal is only a part, and a small part, of that which we have to do. The formation of truthful, honest, industrious, habits; the inculcation of mutual respect and forbearance between class and class, as well as between individual and individual; the encouragement of a large and catholic tolerance for all honest opinion; the spread of that knowledge, social and technical in the first instance, although rising to higher branches of culture by its own innate force and truth;—these are the matters for which it behoves us to labour, and these alone are the means to make the desert blossom as the rose.

On comparing the amount of rental stated by Mr. Gladstone with the details of agricultural statistics from which we have ourselves made the foregoing extracts, it appears that the average rent of cultivated land in England is about 2*l.* 3*s.* per acre; in Scotland, 1*l.* 14*s.* per acre; and in Ireland, 15*s.* per acre. This comparison fully bears out the tendency of our foregoing remarks.

PROFESSOR SCOTT ON ARCHITECTURE AT THE ROYAL ACADEMY.

LECTURE I.

WHEN I delivered my last lectures in this Acedemy, it was my intention to give a practical sketch of the history and development of architecture in this country from the earliest rise of civilisation among the races of which our nation is composed, down, perhaps, to the period of the revival of Classic architecture. As, however, such continuous history has been disturbed by the omission of my lectures last season, and as few now present heard, and fewer, probably, now remember those lectures, it is not my intention to continue my former course, but, adopting as my stand-point the stage at which I had then arrived, to digress into an inquiry into some of the practical and artistic principles of the class of architecture of whose development I was then treating.

The chronological point which I had reached was the close of the eleventh century,—a point well fitted to be chosen as one for leaving the beaten track for the purpose of inquiring into principles. It was the very stage at which the great round-arched style, which had just developed itself into a strong and sturdy luxuriance, was in the condition best suited to receive the refinements of art.

It was, too, the very eve of that wonderful politico-religious movement which was to bring the nations of the West into contact with the East;—thus preparing the way for a vast influx of new ideas and of fresh artistic elements; and, so far as our own country was concerned, it was just the moment when the simple and unambitious architecture of the Anglo-Saxon race had given place to the more colossal edifices and the more systematic style of the Norman invaders; and when the newly-imported architecture, having taken firm root in our soil, was ready to become naturalised as our own, and to be pressed forward in all zeal and earnestness by the united races which—now neither Saxon nor Norman—were becoming, to all intents and purposes, *English*.

Nor let it be supposed that the architecture, thus made ready as the nucleus of subsequent developments, was in itself essentially rude, or mean, or barbaric. I admit that it was stern and severe, and lacking the refinements of advanced art; and that its sculpture, though a reflection from that of Byzantium, as that had been from ancient Greece,—was nevertheless grim, uncouth, and unrefined; yet in grandeur of conception and in vastness of scale its productions vied with those of almost any period or country; and I shall be able to show you that it contained principles the most profound and accurate, and capable of being carried forward to any degree of refinement.

A single half-century had in fact filled the

length and breadth of our land with structures of prodigious scale and impressive grandeur; founded on the most reasonable principles, and containing, in a rough and unrefined form, the most prolific and the most artistic elements. So many of these vast edifices have given place to others of more advanced style, or have been recklessly destroyed, that we can now with difficulty realise the architectural status of a country where they were rising or were just completed in every town and (on a reduced scale) in almost every village;—a period when vast fortresses, such as the Tower of London and the stupendous keeps of Rochester, of Norwich, and of Headingham were specimens of the vernacular architecture to be seen all over the land; when the now shattered ruins of Newark and the grim tower of Newcastle were as freshly erected as their names imply; when the awful names of Durham and Gloucester were but specimens of the "new manner of building" then recently introduced, and which pervaded the whole land; and when no city, or hardly a village, could be approached without the lofty scaffoldings heaving first into view which surrounded campaniles which could boast such as those at St. Alban's and Tewkesbury as their types.

We will, however, quit the track of mere history, to inquire into the intrinsic principles of the architecture thus far attained, and in course of development; and I must beg to be forgiven if, in doing so, I am compelled to repeat a good deal of what I had brought under your notice in former lectures; for, not then intending to go systematically into this inquiry, I had forestalled my subject by adverting to these principles from time to time as the course of my historical sketch chanced to suggest.

I shall, then, firstly consider the architecture in question,—this "*novum genus ædificandi*,"—from a point of view bearing upon its great structural characteristic as a purely *arcuated* style, and one whose strivings all took the direction of rendering that structural fact the main source, as well as the main receptacle, of its artistic character and decoration.

Now what, I would ask, are the conditions necessary to an *arcuated*, as distinguished from a *trabeated*, style?

I would thus define them:—Generally, I would say that such a style should be capable of doing all, whether structural or artistic, by means of the *arch*, which other forms of architecture had done through the use of the horizontal *beam* or lintel.

And, to go more into particulars, I would add:—

1. That, as a rule, openings in walls and between pillars, whether taking the form of doorways, windows, gateways, or intercolumniations, should be bridged over by arches instead of by horizontal lintels or entablatures, though not descending into such purism as to reject the latter when circumstances clearly point to its adoption.

2. That areas inclosed by walls, or by ranges of piers or columns, and of any reasonable width, should be capable of being covered over,—and, in buildings of the highest grade, should as a rule be actually covered over,—by *vaulting*. This rule, however, not being pressed so far as to exclude level ceilings or timber roofs,—the one the most natural and economical covering for rooms, and the other for churches, halls, &c.,—where circumstances forbid the use of vaulting.

3. That the decorative system of the architecture should harmonise with, and result from, these prevailing structural conditions; the construction and the architectural treatment being, not only in harmony, but in the most intimate alliance the one with the other.

Now we all know that Grecian architecture almost ignored the arch, carrying the horizontal or trabeated system of covering openings to the highest artistic perfection; doing for that system just everything which the above-stated conditions would demand for an arched style. *Repose* was the great sentiment which their architecture expressed; *vertical pressure*, the one physical condition it had to provide against; whereas arched architecture (as they say in India) "never sleeps." It is always exerting pressure in some other direction than the mere vertical line, and the physical conditions it has to meet are the resistance of these, as well as the support of mere weight.

We know, too, that Roman architecture admitted nearly all the constructive conditions we have demanded, and carried them on to a very considerable degree of practical perfection. We believe, moreover, that had not circumstances checked its progress, it would have carried out these conditions to a much greater extent. As it happened, however, it did not go so far as to make these structural conditions a leading artistic element, and the groundwork of a distinctive decorative system; but, being broken up through political convulsion before such an end was attained, it bequeathed the task to the descendants of its despoilers, and long centuries of darkness had to pass by before the work could be accomplished.

In Roman works, the arched construction was in many cases studiously overlaid and concealed by the decorative features of trabeated architecture; and, where an arch was architecturally treated, it was for the most part by bending round it the mouldings of an architrave or *beam*: and, where a vault was rendered ornamental, it was often by repeating on its coved surface the coffered panels which had originated in a horizontal ceiling; while, in purely arcuated works, such as the stupendous aqueducts, architectural decoration was usually ignored, and structural grandeur alone trusted to for beauty. Still, however, enough was done to convince us that these great builders were on the high road to a noble solution of the problem, and were only, by external accidents, stopped short of its attainment.

I am not about to indulge in abstract imaginings as to what an arcuated style of architecture might be if originated without the aid of previous associations or traditions; but I would ask you to follow out, with some reference to the previous Classic styles, and aided by our knowledge of subsequent developments, the *rationale* of such a style as that whose leading conditions I have stated.

We must begin with the simplest elements of the style.

Firstly, then, let us take a mere opening in a wall, whether intended for a window or for any other use. As in the trabeated system, apart from architecture, such an opening would be covered by a single block of stone, so in an arched system would it be bridged over by an arch; and, just in the same manner, if a continuous series of openings were required, equivalent to a colonnade, the same simple idea would be repeated,—in the one system horizontal stones lying upon upright ones (as at Stone House) or upon piers, and in the other the openings being covered by a series of arches; the *colonnade* being the ultimate result in the one case, the *arcade* in the other.

To architecturalise the arched opening, or the continuous arcade, the simplest expedients seem to be the insertion between the pier and the arch of an impost moulding to mark the springing line; and, in the arch, either to individualise the arch-stones by chamfering their edges, as the Romans often did, or to relieve their plain surface by moulding, the latter being best suited where the stones made use of are of only moderate size. The mouldings of the arch may, however, be continued down the jambs without an impost, and in either case a projecting rim or hood-mould may be introduced over the main arch to emphasize the line which separates the arch from the superincumbent wall.

These simple changes bring our plain arched opening into something like an architectural feature; and, if we apply them to a continuous arcade, the architecturalising process becomes yet more apparent, and it may readily be carried a step farther by adding pilaster capitals to the piers. Another and yet more important step, inasmuch as it is really the basis of a very marked feature in our arch styles, is the substitution of columns for the piers of an arcade; which columns, having square abaci, are really as well fitted to support the arch as the square pier itself, and at once give a highly decorative character to our arcade; and the more so if the jambs are converted into pilasters.

The abaci, however, of such bearing-shafts ought to be very different from the delicate finish of the Corinthian capital; for the arch is not the same inert load which the columns in a trabeated style are destined to carry. It exerts diagonal as well as mere vertical pressure, and so demands a firmer base. This led the architects of the early arched styles, while adopting the Corinthian capital, and perhaps reusing those of older buildings, to add to it a strong flat stone as an impost upon which they could safely give the springers of their arches a basis larger in diameter than the sustaining column. This form,—that is to say, the Corinthian capital with an added impost,—became traditional, and we find the imitations of it down to the end of the twelfth century.

We have hitherto supposed our arches to be of moderate depth from extrados, or outer line, to intrados, or inner line, and our walls, perhaps, of moderate thickness. Let us, however, assume it to be necessary to increase the depth of the arch, and that the materials at hand are not of large size. In some of the Byzantine remains in central Syria, where the stone is of great size, we find that they have architecturalised by mouldings and enrichments only just so much of the arch-stones as was needful for beauty, and left the rest to go as mere wall-face; and where such large stones are not made use of, it is common enough to build the arch in two rims, and only to deal architecturally with the lower one, or perhaps to leave both plain.

Now, the first may be unobjectionable where the wall is of moderate thickness and the load great, and the second is well suited to large and massive engineering works; but for ordinary architecture, it is apt to give too bulky and cumbrous an effect. This naturally suggests the idea—while allowing the upper range of arch-stones to occupy the full thickness of the wall—of reducing the lower range to a smaller width, thus breaking the arch section into resalient angles, and thereby both lightening its effect and rendering the piers or jambs which support it lighter and less obstructive to the view.

Simple as this step may appear, it is one whose importance can scarcely be over-stated; for it is the starting-point of the entire system of Romanesque and Gothic arch-moulding; it is the origin of the clustered columns, and the deeply-recessed and richly-decorated doorways which mark those styles; and to it we owe in great measure even the traceried windows which are such leading characteristics of Gothic architecture. For, as regards arches, we had before but one angle to mould, whereas we may now have as many as the thickness of our walls will permit, thus generating at once the great Mediæval system of receding orders, whether of arches or their jambs; and you will presently see that this gives us also our clustered columns, which are, in fact, the mere decoration of the receding orders of the piers.

Let us, however, take another step; and, instead of substituting a column for the group of arch-orders, let us substitute either a smaller column for each of the four orders, thus supporting the arches by a group of four columns; or else let these be united into one complex pillar formed of portions of four columns; or, thirdly, let us place a colonnette under each order, grouping them either in the solid or as detached shafts, round a central square pier. In any of these methods we at once obtain the clustered column.

To the jambs we may apply the same process, either substituting a colonnette for the inner order, and pilasters for the outer ones, or *vice versâ*, or substituting colonnettes or pilasters for all. I do not know how early this system of using colonnettes to do merely decorative duty was introduced. We have a specimen of it in the remains of the church built by Benedict Biscop, at Monk Wearmouth, in the seventh century, where, as I have stated in a previous lecture two baluster shafts are placed in either jamb of a doorway to support the impost. To go to the far East, we find the system in use in the Mosque of Touloun, at Cairo, built, I believe, in the ninth century. In one of the doorways of the cathedral at Mayence, built about the end of the tenth century, columns and pilasters, with Corinthian capitals, and crowned by a thick impost moulding, are alternately employed to carry the four receding orders of the arch. The whole has semi-Classic details. In the western portals of St. Mark's, at Venice (close upon the same period), we find a profusion of detached columns similarly used. They are of marble and other rich materials, and were probably brought to Venice from ancient buildings in the East.

It may be that the possession of such antique relics, and the long-established practice of reusing them, may have suggested the use of small columns for such purposes; indeed, it is curious that in the case of the Mosque of Touloun, just alluded to, as a very early instance of the use of colonnettes, there is a tradition that the architect, who was a Christian, was imprisoned for refusing to use the columns torn from desecrated churches, which had been a condition prescribed to him, and only consented to proceed with the work on the withdrawal of this order. Whether

er not this custom originated the feature under consideration, I think that it is one which belongs essentially to a *derivative* style, and would hardly have come into existence in a style of architecture not aided by traditions of the past. The Romans themselves, as is proved by their mural paintings, seem to have indulged in the use of their columns (possibly of metal), for buildings not demanding massive dignity; and it is just possible that in their domestic architecture, some suggestions of this use of such pillars might have existed; and certainly among Mediæval works, in none are they more charmingly introduced than in the cloisters of St. Paul and St. John, at Rome, whose details are much more Classic than Gothic.*

EXHIBITION OF THE ROYAL SCOTTISH ACADEMY.

We cannot say that any of the works exhibited by the local artists this year can be considered as displaying super-excellent qualities, yet it is gratifying to observe that there is a levelling-up process going on, and that there are fewer works that can be classed as beneath mediocrity. The average of excellence, therefore, is greater, and more especially is this the case in the department of landscape painting; and considering the fact that we are so constituted that there is a certain connexion between our external surroundings and our inward thoughts, we may reasonably look to Scotland for a school of landscape painters displaying characteristics of its own; and as it may now be safely asserted that the Northern artists have achieved a marked degree of success in this department, it will meet with our first attention.

The landscapes of Sir George Harvey have a distinct individuality. He does not aim at striking effects, nor does he elaborate detail, nor allow any one part of the subject to predominate in a manner to destroy the general effect sought for. He depicts the cool, breezy upland moor or the peaceful pastoral valley, when Nature is in one of her calm, self-sustained moods; and, when seen from the proper point of view, the scene is full of air, and recedes far away into the distance in which each object is distinctly defined. No. 456, "A Mountain Tarn"—the only landscape he exhibits,—is a characteristic example.

A many-sided man is Mr. Sam Bough. He shows us nature in every phase. He is equally at home on sea or land; amongst the mountains or on the plain. No. 386, "On the Solway," is one of the best paintings he has ever produced. The scene must be familiar to those of our readers who have, in their journeys to Scotland, gone by way of Carlisle. At low tide the river is seen as a broad, shallow sheet of water, bordered by flat expanses of sand, with tufts of green on their margin. Mr. Bough has introduced a herd of cattle being driven through the water, whilst another drove is seen coming up in the distance; sea-fowl are disporting and feeding in the immediate foreground, and the eye is lost in the far distance of the ocean. In No. 446, "Skye," we have the landscape of that island as we know it, and as no other painter, so far as we are aware, has presented it to us. It is a land of rain, with a "brief, bright summer," according to Alexander Smith; but its brightness, in our experience, is very evanescent indeed: the thin film of mist enveloping the hill-sides, as shown in the picture before us, would not prevent a Skyeman from calling it very fine weather.

Mr. James Cassie's pictures are always pleasing, and his work is thorough, but not overdone. He luxuriates in calm sunshine, "when nature seems asleep;" and he is not afraid to look "the god of day" in the face, as may be seen in his "Early Morning on the Tay" (339).

Mr. John Smart has the right stuff in him, if we are not mistaken; for the last few years he has been going on improving in the grasp and mastery of the subjects to which he sets himself. No. 473, "Head of Glen Cloy, Arran," has many of the same qualities as the works of the President; and No. 869, "Beallach-na-Spreidh — Pass of the Cattle," would have attracted greater attention were it not for its resemblance to the fine cattle-piece of Mr. Peter Graham (which hangs in another room)—the same that was so much admired in the Royal Academy last year.

Mr. Colin Hunter is another young artist of promise. No. 718, "Fern Gatherers returning Home," is a striking picture, the effectiveness of which is produced in a very simple manner by the contrast of three horizontal bars of colour; the principal figure, however—that of a girl—is feeble and doll-like. Not so striking, but better as a whole, is No. 832, "Mending the Nets," in which a broad daylight effect is happily rendered.

Mr. Joseph Farquharson has chosen a hackneyed subject for his principal picture (401), "Evening,"—a pine wood, with a road running through it, and a rich sunset filling up the vista: it is, however, well rendered, and we look to him for something much better in the future.

Mr. Walter Pation gives us sunset effects year by year. They are pretty and popular, especially with ladies: it is their very prettiness, however, that we object to; but we must take them as we find them. Purple is his favourite tint, and this prevails in No. 731, King's Cross Point, Arran." In No. 500, "Falls of Glen Ashdale, Arran," a fine subject is spoilt by a sickly straw-colour being given to every tree and blade of grass.

We should have noticed sooner the exhibits of Mr. M'Whirter, No. 592, "Harvest by the Sea," No. 723, "Moor of Bannock," and No. 735, which all display that careful, effective manipulation and mastery of materials which have gained for him a high position.

There are several young men doing their endeavour to produce good landscapes, and we would like to have given them a word of encouragement, but our space is limited, and we must now pass on to the figure-subjects, taking no notice of those which have already been exhibited elsewhere.

Sir Noel Paton (limner to Queen Mab as well as to Queen Victoria) gives us one of those subjects which he has made a speciality, and in which he has no rival. No. 574, "Caliban," shows us the monster listening "to sounds and sweet airs" produced by aërial figures which float around him. The contrast between the heavy, animal matter of Caliban, and the airy, intangible, semi-transparency of Ariel and the accompanying phantoms, is finely rendered, and the scenery of the enchanted island is a beautifully suggestive piece of landscape, seeming as if it would dissolve into air like a dream. No. 728, "The Village Connoisseurs," of Mr. MacTaggart, is a large and happy group of children following a vendor of plaster casts. The juveniles are beautifully painted and natural, if we except their eyes, which are rather too bright, and startle one at first sight by their gem-like effect,—an effect which is heightened by the subordination of the accessories. It is, withal, a fine picture, and would be finer still were a few weeks' more labour bestowed upon it. No. 394, by G. Paul Chalmers, is a life-size study of an old woman reading the Bible, and is remarkable both for vigour of handling and delicacy of colour. The old lady is a type of a class once common in Scotland, but now fast disappearing. She is evidently a firm believer in the Calvinistic interpretation of the Book. No. 505, "A Love Song," being a Spanish lady with her guitar, is brilliant, rich, and warm in effect. Were Mr. Chalmers to concentrate his energies upon a large and important painting, and prove as successful in composition as he has done in manipulation, colour, and character, he would place himself in the foremost ranks of this Academy. No. 408, "Prince Charlie's Parliament," is not one of Mr. Macdonald's happiest efforts. "The young cavalier" is a great favourite of his, but we have never before seen him so unjust to his hero; neither is the colour good: the treakly opaqueness of the walls of the hut in which the council of war is held, is especially harsh. No. 474, "Maternal Care," and 629, "Play," by Mr. Hugh Cameron, display his usual delicate sense of colour and unaffected manner. The expression of the mother in the former and the merry gambols of the children and kitten in the latter show that he can be both pathetic and merry in the proper place and circumstances.

No. 901, "After Marston Moor," by W. E. Lockhart, shows us a cavalier bidding a lingering farewell to his wife and child ere he goes into exile. The male figure is well placed on the canvas, and is truthful in expression; and so, too, is the sturdy babe whom he caresses, but the grief of the lady is only surface deep. There is considerable quaintness in the scene from Longfellow's "Courtship of Miles Standish" (667). No. 511, by Mr. James Drummond, represents Queen Mary led captive to Edinburgh, after the Battle of Carberry Hill, when she was subjected to the reviling of the populace, on account of her supposed complicity with the assassination of Darnley. The queen is dignified, tearless, and dauntless; one would fain hope she were guiltless. The picturesque timber façade of the High-street forms an admirable setting for the figures, but the subordinate groups want completeness. No. 644, "Travellers' Tales," by W. Douglas, is painted with that minuteness of detail and carefulness of finish usual in the works of this artist; in this picture the figures of the two men have met with more attention than he generally gives to them; but still the wine-flagons, &c., are what most attract the notice of the spectator. In No. 538, "The Laird's Pew," Mr. Peter Graham introduces us to a precise old squire of the time of the Georges, who is bent upon being decorous and setting a good example to the parish, but there is little true devotion in him; his daughter, again, is desirous of displaying her charms and fine attire to the best advantage.

No. 304, "Roba de Roma," is the fruit of Mr. Keeley Halswell's recent visit to the Eternal City. Two remarkably fat, jolly-looking priests are intent in the examination of certain ecclesiastical curiosities, which a Jewish vendor is pressing upon their notice, whilst a younger priest is more attracted by the pretty face of a peasant girl, who is taking her goods to market. It is a work displaying great vigour of execution and discrimination of character. Mr. George Hay is fond of Mediæval subjects, which he renders in a quaint and suitable fashion. No. 361, "The Scrivener's Booth" is a characteristic example; and in No. 628, "La Bonne Bouche," we have a subject of later times set before us with equal facility. No. 443, "A Quiet Pipe," and No. 710, "Alone in his Study," by R. P. Bell, are cabinet pictures, crisp in execution and subdued and harmonious in colour.

The architectural drawings will meet with due attention in a future notice.

* To be continued.

ART-WORKMANSHIP: SOCIETY OF ARTS.

We must add to the list of creditable specimens under Division II. (application of ordinary industry, to prescribed art processes) mentioned in our last,* the champagne glasses (118—120), made by Joseph Leicester, in which difficulties, including the introduction of filigrani, are well overcome, and a very successful result is produced. Some glasses with filigrani, sent by T. C. E. Barnes (45—49), are also meritorious, but are unnecessarily thick and heavy. Some of the book-covers by Charles Ffänder are tastefully executed. The only set of fire-irons exhibited (55) are woefully ugly and spikefully unsuitable. For the prize offered for an envelope-case, enriched with carving in low relief and marqueterie, two competitors appear. The case sent by Edward T. Grove is a very charming work.

Coming now to the third Division, articles sent in addition to those of prescribed designs and processes, we find an excellent mask, *repoussé* in copper, of one of the Laocoon group (61), by G. Deere; "Solitude," embossed in copper, by J. C. Day (70); and a circular ornament very cleverly pierced in metal (74), by A. Millward. The purpose to which the latter can be applied is not very obvious, but the regularity of the forms and the precision of the cutting are praiseworthy. Under the head of wood-carving there are figures of Moses and Elias formed with inlays of various woods: they are somewhat hard and *gaucho*,—. Elias especially, but should not be passed by. Such work might be found useful in mural decoration. 84, oak bracket by R. A. Brangan, and 85, panel in birch wood, by W. Matthewar deserve mention. The works modelled in plaster call for little mention. 101, North America; Indian, by A. Dufour, is spirited and vigorous and a wreath of flowers, by T. Godfrey (100), has some elegance. Among the carvings in marble, 109, a bracket, by S. Moutrie, deserves mention. A stone bracket, by T. E. Jago, shows good intentions. A human head is introduced, and some inlays. The red colour of that in the top ornament gives a certain degree of vulgarity, and lessens the value of the rest of the work. 116, study in Tisbury stone, "May," J. R. Heath, is a remarkable piece of cutting, though not defensible in principle: few would guess that the work was in stone. The tea service (125), designed and executed by Isaac Wild, should certainly obtain for him some recognition; the ornament, though not well selected, is well

* See p. 141, *ante*.

executed, and the gilding shows more than common skill. The "Burning Heart," a porcelain slab, by Miss L. L. Hawkins (131), is a quaint conceit, or "Emblem," better intended than executed. And with mention of a porcelain tray, painted with "David, the Psalmist;" and a very good cameo portrait of Dr. Billing, executed from the life, artist not named, we may bring our notice to a close.

Beyond the premiums offered by the Society of Arts, the North London Exhibition Prize, consisting of the interest of 167*l.* 7s. 3d. Consols, is to be awarded for the best specimen of skilful workmanship in the exhibition of works sent in for prizes. We have reason to believe that this will go to Messrs. W. & H. Robson, for their wrought-iron work for a balcony, a decision in which we should fully accord.

PARIS STUDIOS AND THE "GRAND PRIX DE ROME."

WE have mentioned in a former paper the architectural subjects taught at the Zurich Polytechnicum, and at the École des Beaux Arts, Paris. *How* are they taught? Such is the question we shall try to answer, by sketching the artistic life of a Parisian *atelier*, and the laurels that life leads to.

Plato, Aristotle, and most Greek thinkers were of opinion that learning should be the result of *debate*, and that a dogma only became a truth after winning many victories, and never encountering defeat. Frenchmen adopt that view with respect to artistic education. They hold that genius can reach perfection only when helped by experience and copious criticism. An aspiring artist, they think, should have hourly intercourse with other artists bent on aiding him in his artistic efforts. The Paris world of art-students and the Paris *ateliers* are the upshots of that belief.

An architect's *atelier* in Paris is, so to say, a private club of students of architecture. The master of the *atelier* is an architect of fair standing, perhaps a *Grand Prix de Rome*. The elect of the students, it is his mission to direct and counsel them in their architectural pursuits, and to work them up for the *Grand Prix de Rome*. Nothing can exceed the fatherly anxiety of the "patron" (the master's title) for his pupils, who are, indeed, his intellectual children, and the trustees of his artistic past. A Parisian *atelier* is a republic of young artists ever anxious to rival the bygone triumphs of their predecessors, and to break new ground. The students are grown men, but as disinterested as poets. They love ideas for their sakes; the artistic muse for her sake: they are not practical. For them an art is an art—not a trade. Many a poor student has found poverty sweet in the fancied halls of his imagination. Many a poor student does the night-drudgery of some flourishing Paris builder, in order to have the day to improve his taste and learning with his comrades of the *atelier*.

The teaching is mutual: the fresh men are instructed by the old stagers in exchange for their handiwork. Thus, a fresh man gets practice over the plans of an older man, and the boon of his advice; while the advanced student can strike out the most ambitious designs, backed as he is by a staff of half a dozen juniors. So, by mutual co-operation, both tiros and veterans are equally benefited.

The students mix on terms of familiar equality. A constant exchange of opinions fills the pupils' minds with ready and varied knowledge. As a consequence of this commonwealth life, the *atelier* has a commonwealth spirit. "*Unus pro omnibus, omnes pro uno*," such is the watchword to which few students ever play false. And yet the rivalry of Paris artists is fierce, though self-giving. Every man tries his utmost to win, but is bound by the rules of the *atelier* to help others on to victory.

Every *atelier* rejoices in triumphs and memories of its own. One artistic generation after another is drafted into active life; "patron follows patron," but the old spirit is ever brooding its old devices within the old walls of the *atelier*. Thus, conservative and progressive, each *atelier* strives to hold its own under the banner of its past. Hence the keen competition between *ateliers* for the *Grand Prix de Rome*, the greatest prize that France can offer her artistic sons.

And now a few words about that studentship. The man who is proclaimed *Grand Prix* by the examiners (see *Builder*, Jan. 22), may go and pend four years in Rome or Athens, at the expense of the French Government. If in Rome, he takes up his abode at the Palace of the Medicis, which now belongs to France.

But wherefore these Roman pilgrims? What comes of their musings in the interest of art and France? We shall answer those questions by quoting from M. Garnier's* book, "À Travers les Arts." The astute critic, speaking of contemporary French art, says:—"The present period is the architectural period of *truth*, not that of *original shams*. The inside of a building is what its outside tells us it should be. If we look at the ornaments, which are to an edifice what expression is to the human face, we can trace back their genealogy to Greek art, though they often smack of something which betrays the individuality of a nineteenth-century man. They are not copies of a justly-admired style, but new modes of rendering it. The Grecian muse has breathed into us her vital spark, and harmonised our conceptions;—but the conceptions are ours, French art ours. Greece finds perfection, but France fashions it to her genius and her needs, and, by that expansion of Grecian originality, claims an originality of her own, none the less meritorious for its Grecian lineage. Our forefathers worked a Renaissance out of Roman art. We think that modern France is destined to generate a yet more comprehensive revival, which will be the fruit of our minds rather than that of our traditions. All sound reformers must be sound historians. So we see that the men who have done most for *French* art, have been most learned in *ancient* art. At Rome it was that Duban, Labrouste, Duc, Vaudoyer, Baltard, and others grasped the past with one hand and pointed to the future with the other. At Rome the *Grand-Prix* men gather, at the hands of the great masters of old, materials for judicious innovations. One might almost say that old Rome has built modern Paris."

At a dinner given last year by the *Atelier Lebas* to the *Prix de Rome* of former years, the bills of fare were ornamented with the following suggestive design. In the foreground, the *Atelier Lebas*, and in the distant background, *Rome*. That design typifies art-education in France. It means years of labour, and, in some cases, years of privation, in order to secure the highest art-training the old masters can give. It means enthusiasm for *the beautiful* and *the ideal*, and a determination to prefer them to all material interests. It means the far-sightedness of a people who are aware that, next to religion and philosophy, art is the greatest civiliser that ever came from God to man.

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THE SEWAGE QUESTION.

A LECTURE on this question has been delivered in the Philosophical Hall, Leeds, by Mr. Filliter, C.E., resident waterworks engineer to the Leeds town council. The attendance included the mayor and several members of the corporation. In illustration of his lecture, Mr. Filliter had prepared an extensive series of diagrams, and to these he made constant reference.

In the course of his lecture he said, a belief had of late years been gaining ground that separate sewers would have to be made for rain-water and sewage, and in an official report, lately presented to the Home Secretary by Col. Ewart, on the drainage of Oxford, Eton, Windsor, and Abingdon, he had recommended this course to be adopted. This point was likely, ultimately, to prove the key to one part of the sewage difficulty. As, however, Leeds and its sister towns were sewered on the joint system, and as a change to the separate system would be costly, and not likely, therefore, to be readily made, Mr. Filliter proceeded to describe the known methods of dealing with sewage as it actually exists. These he divided into two principal groups,—first, those which endeavoured by mechanical or chemical means to remove the offensive matter, in order to convert it into solid manure, which might be classed together as "Sewage Manure Methods;" second, those which took the sewage direct to land, and attempted at once to purify the sewage, and abstract its manurial elements by placing it in contact with earth, which might be denominated the "Sewage Irrigation Methods." There were other methods of dealing with refuse matter, amongst which he mentioned the Eureka system, as formerly tried at Hyde; Dr. Bishop's plan, once in use in Leeds; and the Moule's earth-closet system. He scarcely considered these as being within the scope of his paper, but he believed this part of the subject to be well worthy of grave consideration; for upon further investigation it might, after all, prove simpler and better not to allow house refuse to become sewage at all, rather than to attempt to purify and utilise it when so made. In illustration of the simplest method of purifying sewage,—namely, by deposition,—the lecturer stated that the sewage of Leeds would fill a reservoir eight acres in extent and 5 ft. deep every day, so that a week's storage would require at least sixty acres of land, or a tract about the size of Woodhouse Moor.

Having mentioned the methods commonly adopted for obtaining a solid manure out of sewage, Mr. Filliter proceeded to describe the various systems of irrigation. It was found, he continued, that the sewage of about 100 persons might be utilised on an acre of sewage meadow, and that the effluent water was tolerably pure and free from offensive odour. Having spoken of this plan, as practised at Harrogate, Croydon, Warwick, Edinburgh, South Norwood, Birmingham, Barking, and other places, he said that, supposing Leeds had to irrigate, he found that they would have to carry a conduit past Knottingley, where there was almost any quantity of sandy land. If the farmers there objected to use the sewage, we might go to Thorne Waste, where, on a tract of 5,000 acres, practically worthless, we might demonstrate its value. The great drawback to this scheme was that Thorne Waste was twenty-seven miles away, and as it would involve a conduit twenty-seven miles in length, it was a grave question. How far irrigation had succeeded in a pecuniary point of view he could not confidently say. Its advocates adduced remarkable examples of heavy produce and large receipts, but it could not be forgotten that these were produced upon land which had cost much to put into shape, and required much to keep it in working order. Without in any way ignoring the success and apparent superiority of the irrigation system, it seemed to him that purification by deposition presented in some cases actual advantages, combined generally with prospects hopeful enough to warrant further experiment, by the engineer and analytical chemist working together. It was still open to grave question whether sewage, as we know it, ought to be allowed to be formed at all, and this view of the subject ought not to be lost sight of. In conclusion, he remarked that no single system could be held applicable to all towns and all localities. The several circumstances of each place, as to situation, as to level, as to temperatures, as to rainfall, as to markets, and many other matters, must be duly weighed and carefully regarded in devising any proper sewage scheme for that place.

Mr. Edward Smith, F.C.S., &c. (of Torquay), in a paper on "The Chemistry of Sewage," recently read before the Torquay Natural History Society, reviewed the question of the profitable application of sewage to the land. He referred to the immense national loss of the present wasteful system, and after declaring the inadequacy of irrigation, urged the necessity of preserving the excreta of towns, and mixing them with deodorising material, and points out a method by which this important object, he thinks, may be carried into effect:—

"We now come to the consideration of the application of the excreta in a solid or non-fluid state to the land, popularly known as the 'Dry Earth System.' I am not aware that a single objection can be made to the principle of direct application of excreta to the soil. As I have previously stated, the great difficulty hitherto has been the want of a suitable absorbing material. Dry earth is not sufficiently absorbent to enable us to apply it economically on a large scale, although at Wimbledon during the very hot weather, it was the only system that succeeded. . . . . .

Mr. C. Stanford, F.C.S., an able chemist, has suggested that sea-weed char may be used as an economical and efficient substitute for dry earth. He has made some experiments in this direction, and finds that while perfectly dry earth absorbs 45 per cent. of water, sea-weed char absorbs 147 per cent.; the former becoming a sludgy mud, whilst the latter can be easily removed.

The mixture of sea-weed char and excreta, when removed and placed under cover, soon dries without producing the least nuisance. It can be stored for any length of time, and used again several times."

At a meeting of the Committee of the British Association on the Treatment and Utilisation of Sewage, at which there were present Mr. Grantham, C.E. (in the chair), and others, the honorary secretary presented the list of subscriptions from the various towns contributing towards the expense of a practical and comprehensive inquiry into the

treatment and utilisation of sewage. He reported that he had addressed the circular to 663 corporations and boards of health, and received replies from 245. The subscriptions amount to 786*l.*, exclusive of the 50*l.* given by the British Association. Of those towns and districts which replied to the circular and did not contribute, 25 deferred their decision for consideration, and 23 merely acknowledged the receipt of the application without any intimation as to their intentions; while the remainder, amounting to 116, refused on various grounds, some because they thought the inquiry ought to be conducted at the expense of the country generally, and some because, though they approved of the inquiry, they were too poor to contribute. The committee, after a careful consideration of the matter, was of opinion tnat the amount already subscribed was sufficient to justify the commencement of the inquiry, but that unless a larger number of places joined in contributing, the inquiry would not be sufficiently extended.

THE SOUTH KENSINGTON SCHOOLS OF ART.

THE prizes to the students of the South Kensington Schools of Art have been distributed by the Prince of Teck. Mr. Cole, C.B., who conducted the party into the new lecture theatre, said that Earl de Grey had found it impossible to be present. The Art School of South Kensington was one of 110 art schools in the kingdom, but these were partly supported by subscriptions, while the students' fees at South Kensington paid the expenses of the school. He regretted that the students did not make more use of the museum, which was an advantage such as none of the other schools possessed. About 150,000 students now attended these various schools, which cost about 1*l.* per student,—a very small sum in the aggregate when compared with the commerce of this great country.

The medals and other prizes distributed were won in the national competition of 1869, and the works to which they were awarded were executed in the twelve months preceding the April of that year. The medals and books distributed represented only the highest grade of distinctions obtainable by students, male and female, and consisted of three gold medals, and the Princess of Wales's Scholarship of 25*l.*, six silver medals, 12 bronze medals, and 21 Queen's prizes of books, all won in the national competition, besides 29 prizes of books, and 22 free studentships, won in the elementary or local prize section. This included the whole of the prizes gained at the great annual competition. At the second grade examination in March, and which consisted of examination by written papers in geometry and perspective, and exercises in freehand and model drawing, 120 students "passed," 36 won "prizes," and six obtained "certificates." At the third or highest grade examination, 13 students obtained the teacher's certificate. Besides the above regular prizes and distinctions, occasional prizes have been offered by the Department and by manufacturers during the year, some for general competition, and some only for this school. The Worshipful Company of Plasterers offered prizes of 25*l.* for designs for a "Truss," and an "overdoor ornament," limiting, however, this school to one subject: two students obtained the prizes of 8*l.* 8*s.* and 5*l.* 5*s.* respectively. Messrs. Corbière offered during the year prizes of 5*l.* and 10*l.* for designs for silk fabrics and for paperhangings for manufacture in France. Besides the works obtaining these prizes others were purchased to the amount of 18*l.* 5*s.*, and most of these works have been produced in France for the French market. Since the last distribution of prizes, 16 male and 6 female students had been admitted to the schools of the Royal Academy. One student (W. R. Bromley) from the school here had this year obtained the Royal Academy silver medal for the "figure from the antique." In the half-year ending February 29, 1864, the number of students was 382; the amount of fees, 878*l.* 11*s.* For the half-year to end February 28, 1870, the number of students is, at the present time, 766, and the amount of fees, 1,363*l.* 11*s.* Of the number of students, 470 are males, and 296 females: 199 are free students. Of the 103 schools competing, these schools took 3 gold medals out of 10, 6 silver out of 20, 12 bronze out of 51, and 21 Queen's prizes out of 102.

Mr. Redgrave addressed the students, and said that one of the principal objects of the school was to elevate the general taste, and to make, not art-students, so much as students useful to manufacturers. They ought to study the works which others had done, not to copy them, but to stimulate their own invention and to enable them to conceive others in the same spirit.

Of the prizes distributed the following were the most important in the female school:—Gold medal and Princess of Wales's scholarship of 25*l.*—Marianne Mansell, design for porcelain. Silver medals—Edith Edenborough, monochrome, in oil from antique; Kate Greenaway, head from life, water colour. Mr. Cole specially mentioned a bronze medal for a "time sketch" by Edith Edenborough as an example of rapid execution only to be gained by hard and patient study. In the male school.—Gold medals—William Walter Oliver, drawing from antique; Harry S. Palmer, group, water colour. Silver medals—Charles Edward Black, head from antique; Joseph Harris, design for lace; Edward Charles Slocombe, design, hangings and jewelry; Thomas W. Wilson, design for tiles. A number of bronze medals and of books were also given. At the close of the distribution,

The Prince of Teck congratulated the successful students on what were their rewards for past work and their encouragement for the future. He was glad to perceive that the study of art was placed within the reach of all classes in the kingdom, and he thought we ought to feel deeply indebted to those who facilitated this teaching, which was of value not only to the country but to the whole world. It was also pleasant to observe that some of the designs of the students had been purchased by French manufacturers. He rejoiced to see that a convention had been made for the interchange of reproductions with foreign museums. It was impossible to visit the museum of South Kensington without being reminded of one who had been a great promoter of art and science in the country—the Prince Consort. It must be a satisfaction to Mr. Cole, who had worked to aid the prince, to know how fully these schools realised the prince's wishes.

FARMING COVENANTS.

AT the ordinary general meeting of the Institution of Surveyors, on February 21st, Mr. John Oakley, in the chair, a paper on this subject, by Mr. Elias Pitts Squarey, member, was read.

The principle which ought to govern farming covenants would seem to be, that the tenant should have the freest and most unrestricted use of the lands and premises, consistent with the maintenance and yielding up of the freehold at the end of his tenancy in an unimpaired and uninjured condition; and the object of the paper was to indicate the relaxations and modifications, in whatever direction, which appear likely to conduce to increased production without injuriously affecting the interests of the landlord, and to deal with the separate questions of rent, covenants as to cropping, repairs, and entries between outgoing and incoming tenants.

We give his observations under the head of *Repairs*:—

"Repairs are a large and important feature in farm agreements, and probably lead to more questions, troublesome of solution, between the landlord and tenant, than any other condition of tenure. The ordinary arrangements are,—

1st. Where all repairs are borne by the landlord.

2nd. Where all are borne by the tenant.

3rd. Where the landlord provides the materials and the tenant pays the labour.

4th. Where the landlord finds the materials and shares with the tenant the cost of labour.

It is obvious that these varied conditions proportionably affect the rent which is payable, and theoretically it would seem to be of little importance by whom the necessary reparation is made; practically, however, it is far otherwise: Left to themselves, and without any liability to made good the wear and tear which inevitably happens to farm buildings, the tenant is too frequently careless of the cost of these repairs, and permits waste and injury to his premises, which, had he an interest in their economical maintenance, would never arise. On the other hand, where the entire onus of repair is thrown on the tenant, he is too much disposed to evade, as far as possible, his liability: hence things go undone, which, trifling in themselves at the outset, by the end of a long occupation, assume very serious proportions. Arbitrations or legal proceedings are frequently necessary for their settlement, and it is exceptional if, in such cases, the tenant is not relieved of a portion of the liability which, directly or indirectly, should properly fall upon him. For myself, I am inclined to the belief, that the fourth adjustment of the liability, *i.e.*, the division of the cost of labour by the landlord and tenant, most fairly meets the difficulties of the case.

The tenant's proportion of expenditure is limited to an amount which is more than balanced by the comfort and advantage of the maintenance, in proper condition, of his premises; and to avoid the large liability which is certain to result from neglect of prompt repairs, he will certainly be continually pressing on his landlord or agent the necessity for keeping things in good order.

Let me suggest, as exceptions to the materials to be provided by the landlord, straw for thatching, and glass and leadwork; further, the tenant should be bound to do the carriage of materials for repairs within reasonable distance. As with land, so with buildings, dilapidations at the termination of a tenancy should be more strictly enforced than is now the usual custom; but it is clear that the tenant should be only liable for a legitimate and necessary reparation, and not for restoration or reinstatement."

A discussion, in which several members took part, followed the reading of the paper, and was adjourned to Monday, March 7th.

LORD BACON AND THE ENCLOSURE OF COMMONS.

AT the present time the following scrap from the pen of the "wisest of mankind" may possibly have some interest. Francis Bacon desired to ackrowledge his obligation to the Earl of Essex; but also desired to decline being mixed up with any folly or extravagance in which that headstrong young nobleman might desire to involve him; and concludes a letter to him thus:—"For your lordship I do think myself more beholding to you than to any man. And I say I reckon myself as a *common*. . . . And as much as is lawful to be enclosed of a common, so much your lordship shall be sure to have."

This is an extract from "Spedding's Letters and Life of Lord Bacon."* The author infers the following paraphrase:—"You can have for your own share only 'so much as is lawful to be enclosed;' that is, I can only offer you such services as can be lawfully rendered by one whose chief service is due to the State."

G. M.

THE LABORATORY, ETON COLLEGE.

THIS is a building necessitated by the increased importance wisely given to science at Eton since the appointment of Dr. Hornby to the headmastership of the school.

The arrangement is shown on the accompanying ground plan; besides which, there is a heating-vault arranged under the end of the lecture-room gallery, vaulted over with brick, and two additional rooms on the upper floor for purposes in connexion with the laboratory, which are approached by the passage staircase, and by a door at the gallery end of the lecture-room opening on to the staircase landing.

The walls of the building are of local red brick, with Bath stone dressings; the roofs are covered with brindle-coloured Staffordshire tiles, those of the laboratory and lecture-room being open-timbered. Special attention has been paid to the arrangement and general detail of the fittings, in order to make them as suitable and convenient as possible for their intended purposes; and in the matter considerable thought has been given by Mr. Madan, Fellow of Queen's College, Oxford, and head of the science department at the school.

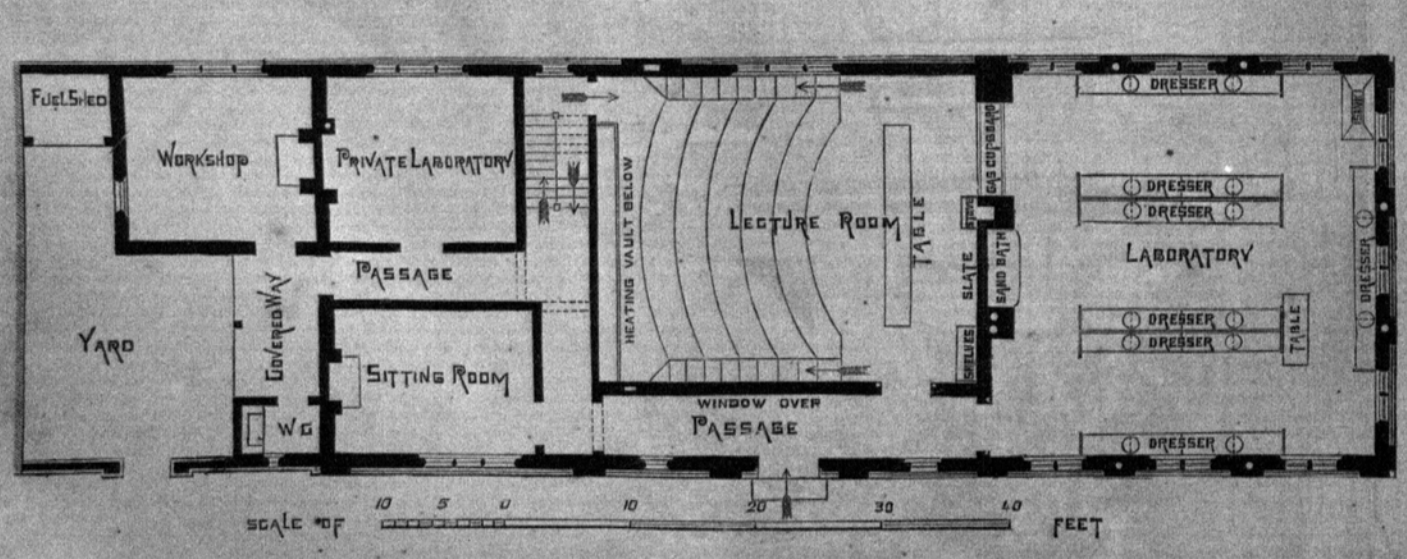
The building is heated by a boiler apparatus in the vault, and hot-water pipes in connexion therewith running throughout the building; the ventilation of both laboratory and lecture-room has been well provided for; and provision is also made by means of pipes acted upon by gas jets for the purpose of more effectually carrying off the gases occasioned by the chemicals.

The architect is Mr. William Wilkinson, of Oxford; and the builders are Messrs. Fassnidge & Son, of Uxbridge, who are also supplying the heating apparatus. The cost of the building, exclusive of the fittings, will be about 2,000*l.*

* Vol. i., p. 373.

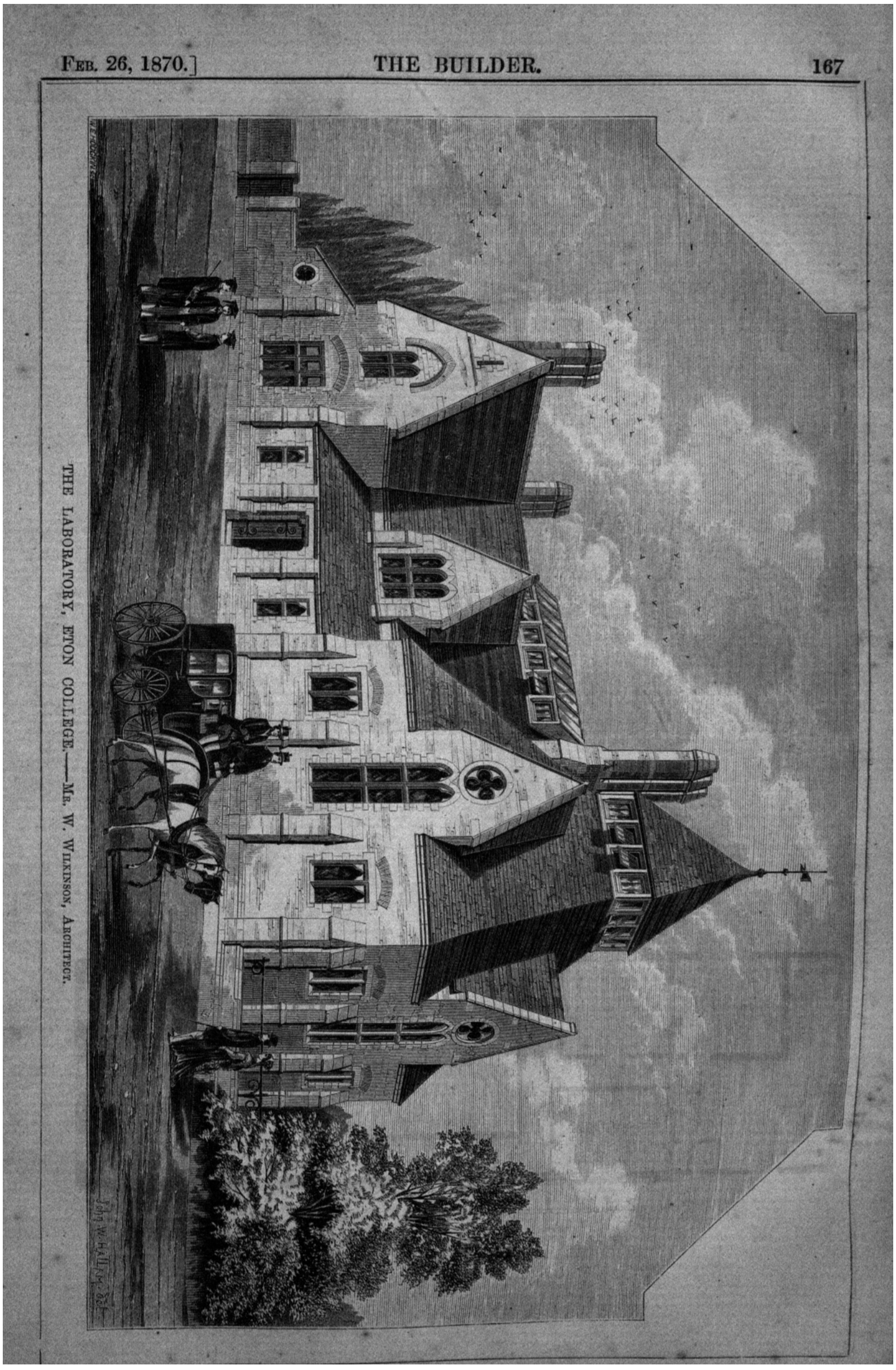
MR. WILLIAM HAYWOOD,

Engineer of the Holborn Viaduct.



THE LABORATORY, ETON COLLEGE.

Plan.



THE LABORATORY, ETON COLLEGE.—MR. W. WILKINSON, ARCHITECT.

THE HEALTH STATISTICS OF LIVERPOOL.

AT a recent meeting of the local health committee, Dr. Trench, the medical officer of health, presented his annual report, which set forth that during the 52 weeks of the year 1869, terminating on the 1st January, 1870, the returns of the local registrars recorded 18,668 births and 14,744 deaths within the borough of Liverpool. Of the births 9,467 were males and 9,200 females, making the total birth-rate for the borough equal to 36·6 per thousand. Of the 14,744 deaths, 7,588 were males and 7,156 females. The death-rate of the borough was equal to 28·9 per thousand, or 3 per thousand less than the average rate which had prevailed during the previous ten years. The death-rate of the parish was equal to 31·6, and that of the out-townships to 25·8 per thousand of the estimated population. There were at the last census, in 1861, 60,760 children under five years of age within the borough of Liverpool; the number might now be estimated at 69,672; and therefore their mortality in 1869 was equal to 10·5 per cent. of the whole; 4,461 infants, or every fourth child born within the borough of Liverpool died before attaining the age of twelve months. Zymotic diseases occasioned 4,238 deaths during 1869, and this accounted for 28·7 per cent. of the total mortality within the borough. This was nearly 1 per cent. less than the proportional rate of zymotic deaths to deaths from all causes during the preceding decennial period. Typhus and remittent fever accounted for 783 deaths, or 542 in the parish and 241 in the out-townships—a rate equal to 1·5 per thousand per annum of the estimated population. Under the head of "sanitary work" reference is made to the conversion of privies into water-closets. It appears that to the end of 1868 there were 13,391 privies so converted, and, during 1869, 1,857; so that the work was nearly done. As to registered lodging-houses, the number in the borough at the end of 1869 was 1,149. In addition to over-crowding—for which 549 persons were brought before the magistrates, and fined in sums varying from 1s. to 10s. and costs—the offence of permitting adult males and females not married to occupy the same room came under notice, and was entered in the books of the inspector. There were 365 rooms found to be thus occupied by 649 males and 691 females; and there were also in these rooms 139 children between the ages of five and thirteen years. The medical officer expresses an opinion that the Workshops Regulation Act, however beneficent in intention, is not only impracticable in its machinery, but inequitable in its effects.

CASES UNDER THE BUILDING ACT.

WE have received the following letter:—

Sir,—We are instructed by Mr. George Willsmer, of Vicarage-road, Leyton, Essex, to call your attention to the paragraph in your paper of the 5th inst., entitled "Cases under Metropolitan Building Act," and purporting to be the report of a case before Mr. Ellison, at Worship-street.

There is a sentence therein as follows:—"A fresh notice was given in October following by Willsmer, of Old Ford-road, for proceeding with the works, and the houses were covered in the same month." The report then runs,—"The houses remained unfinished for some time, and the builder Willsmer could not be found."

The last sentence which we have quoted was not in evidence before the Court, and is untrue. Mr. Willsmer complains that it is to be inferred from the report that he has gone out of the way, whereas, upon inquiry made at his late place of residence, he could easily have been found.

The report has injured Mr. Willsmer's credit with persons from whom he has been in the habit of buying goods, and on his behalf we have to request that an apology for the insertion of the paragraph complained of be sent to us, and that a contradiction of the statement be made in two successive issues of your journal, such contradiction to be approved by us. We may add that a similar case to the one reported was heard at the same Court a few weeks after the one reported by you, and, upon the magistrate deciding in favour of the surveyor, a case was granted for the opinion of the Court of Queen's Bench upon the legal point involved in the decision.

We have only to add that, in the event of Mr. Willsmer's reasonable request not being complied with, he will take such steps, with a view to clear himself from the prejudical inference from the report, as he may be advised.

Yours faithfully,
APPLEBY, WRIGHT, & CROWTHER.

We have every reason to believe that the brief report we gave of what took place is correct. The district surveyor informs us, in reply to an inquiry, that he said in court he had endeavoured to find out where Mr. Willsmer had gone, but could not succeed, and authorises us to refer Messrs. Appleby, Wright, & Crowther to him. Our report is a dry statement of what we believe took place, without a tinge of *animus* of any kind. We know nothing whatever of Mr. Willsmer, and have not the remotest desire to do him any injury. We are quite willing to believe the statement that he would have been found if he had been properly looked for.

DECISIONS UNDER THE METROPOLITAN BUILDING ACT.

MESSRS. EBBS & SON, builders, of 9, Northwicke-terrace, were summoned before Mr. Mansfield, by Mr. Alexander Peebles, district surveyor of North St. Marylebone, to show cause why they refused to pay the sum of 4*l.* 15*s.*, the fee for surveying an alteration to the external wall at the nave end of the English Presbyterian Church, at Marlboro'-place, Abbey-road, executed after the church had been roofed in.

Mr. Joseph E. Turner, solicitor, appeared for the district surveyor; Mr. Ebbs appeared in person.

The facts of the case, as proved by the evidence, are as follow:—

The notice for the erection of the church was given on the 30th of April, 1869, and about the end of the third week in October the roof was slated over, with the exception of a space of about 5 ft. at the tower end, which was left unslated for the passage of the scaffolding for the tower, then in course of erection. The wall in question was originally intended to be, and was built up as, a blank wall, some time before the roof was covered in. After the roof was covered in, four windows were cut away for in the blank wall in order to improve the effect of the church. The windows consisted of three single-light openings, surmounted by a large wheel or rose window.

Mr. Turner contended that the roof having been covered in previously to the commencement of the alteration, and the alteration affecting the construction of an external wall, the Special Rules of the 13th section of the Act came into operation, and the district surveyor was entitled to the further fee provided by the first part of the 2nd schedule to the Act. With reference to the part which remained unslated, he contended that this portion of the roof was immaterial; that the roof, as a whole, had been covered in within the meaning of the 9th section of the Act, and that the small opening left for the scaffolding could not be said to prevent the building from being covered in within the meaning of that section. An offer of compromise had been made by Mr. Peebles, but refused by Messrs. Ebbs.

Mr. Ebbs, on the other hand, contended that inasmuch as the space of 5 ft. had been left unslated, therefore the church had not been covered in within the meaning of the section, and the district surveyor was not, therefore, entitled to a farther fee.

The Magistrate took the latter view, and said that although the church might otherwise have been completed and used for religious services, yet, if a part of the roof had remained uncovered, he should not consider the building to have been roofed in within the meaning of the Act.

CONDITION OF THE BUILDING TRADE.

SIR,—I have read in your paper, and I know myself, that thousands of building artisans are out of employ. I believe I may say there never were so many out of work at one time before; and yet I have just now seen the following statement in a newspaper:—

"The joiners of Glasgow have resolved that on and after the 1st of March they will have a half-penny an hour more than at present, and that they will only work nine hours a day."

How are the two statements to be reconciled? I am a dealer in corn, and always find that when there are more sellers than buyers I have to reduce my price, and wait for better times before I raise it.

ECONOMIST.

Your correspondent, "Trying Plane," if he reads my letter carefully, will see that it applies to working men, and not foremen; and that 8d. per hour is the mean, and not the extreme, price paid. He quotes Adam Smith; but there is nothing in Adam Smith more evident than the uncontrollable influence of supply and demand. Your correspondent's list of his requirements is amusing. Why not allow his wife a pair of dapple-grey ponies? It would be as reasonable as to expect what he enumerates, when the demand for labour is so depressed as to compel very many to leave the country, whom every sensible man would wish to retain. Adam Smith's observations as to over-strained profits are very true; equally so his observation that high-priced labour can be well supported when a nation is "growing rich." The present argument is, whether high-priced labour can be supported when the country is not "growing rich," and when the supply of first-class labour very much exceeds the demand. No man who really studies the subject begrudges the payment of high wages in prosperous times: it benefits the man that receives them, and the country generally by the increased money the workman has to spend. But there comes a time when every trading interest is depressed; when a man cannot sell a house for any amount approaching the money which it cost to build, and in a large proportion of second-rate property. Then crops up the question at issue, viz., whether a combination of working men can protect themselves from the inevitable effects of "supply and demand." This subject is worthy of ventilation by an abler pen than mine, but your correspondents would do good service if they could satisfy the simple inquiry, "Whether a man requiring the highest rate of wage in prosperous times and depressed times, accepting the natural consequence of being out of work under the latter state of circumstances, would in a twelvemonth receive more money than the man who accepted work at the best price the state of trade would afford." If, taking this inquiry over a large body of men, the first proves to be the case, there may be some justification for a uniform rate of high wages; if the other, 8d. per hour uniform rate is not so high in point of advantage as submitting to the natural influences of "supply and demand."

SENEX.

SIR,—I have followed with much interest the correspondence on the above subject, and your impression of the 19th shows some of the reasons why the trade is in the state it is. On page 144, there is a letter signed "Trying Plane," which appears to be from a joiner who prefers to be idle rather than work for less than 8d. per hour.

On page 155, we see that the plasterers in Mr. Aldin's employ have struck rather than work for 7½d. per hour. These instances show that the working classes do not yet perceive that they must accommodate themselves to the times, although their employers are forced to do so. The competition to obtain contracts is far too great for much profit to be made; and I should like to know how many master builders have done more than pay their expenses during the last two years, while we know that many have not been able to do that.

There are many clerks and others,—men who have received good education,—who would thankfully accept situations, if they could get them, at salaries far below what they feel they are worth; and our working-classes must look for employment in the same spirit.

The building trade is now in a deplorable condition, and in my opinion will be worse, so far as the operatives are concerned, before it gets any better. It will have to go through the same process that the cotton, and steel, and other trades have had to submit to, and the skilled workmen must be prepared to see mechanical appliances introduced into the building of the future to a much larger extent than heretofore.

Architects and builders must turn their attention to labour-saving apparatus in every branch of the trade, so as to bring the cost of building down to a rate that will induce the public again to invest in this class of property. The efforts recently made to introduce concrete houses seem steps in the right direction.

IRON.

*** We have received a dozen other letters on this subject, to some of which we may give further consideration.

THE TRAMWAY BILLS.

NOT only is the metropolis to be interlaced with tramways, if the numerous projects in hand be carried out; but in probably every large town in the country, tramways are the talk. That a revolution in town transit is on the eve of taking place, is evident; and it will be for Parliament to see that the inevitable change is discreetly and properly carried out.

The propriety or desirability of handing over portions of our great thoroughfares to private companies, as proposed, has been questioned; and although we are altogether in favour of tramways, this, we think, is a question well worthy of careful consideration. But if private companies are not to be allowed, under any circumstances or conditions, to interlace our thoroughfares with tramways, public authorities ought to be compelled to do so on some consistent and continuous plan. In the metropolis, especially, where there are so many different, and not interdependent, authorities, supervision and a gentle compulsion would especially be requisite.

Mr. William Booth Scott, C.E., the chief surveyor to the St. Pancras Vestry, reported on the subject to his constituents so far back as February, 1868, and again in the present year. The conclusions of his elaborate report just printed, are of public importance; and we may here give them in a more or less condensed form. Admitting the expediency of tramways, he is of opinion—

That they cannot be laid and worked upon roadways of great traffic, "so as not to impede or injure the ordinary traffic of the streets."

That it would be inexpedient to permit companies of private individuals to lay tramways upon public thoroughfares, as by so doing they would usurp a right to control the use of the thoroughfares by the community at large, and would virtually establish a gigantic monopoly of the passenger traffic.

That it is possible to devise and carry out a comprehensive scheme of tramways for the metropolis, so that the community at large may reap all the advantages, while by proper and undivided management the inevitable inconveniences might be reduced to the minimum.

That the only satisfactory mode of thus dealing with the matter would be by the institution of a corporate body, to be called, say, the Metropolitan Tramway Board, upon whom would devolve the duty of devising, constructing, and managing such comprehensive scheme, and extending it from time to time.

That the privilege of running cars upon the tramways so constructed should be put up to competition and let by tender annually, or for terms of years, upon terms and conditions defined by the Metropolitan Tramway Board.

That the revenue derived would not only (rapidly) defray the cost of constructing and maintaining the tramways, but would also produce so large an annual surplus as to reduce the general or paving rate at least one-half over the whole metropolis.

That companies of private individuals ought not to be permitted to establish a monopoly, and appropriate such an immense revenue by the use of the public thoroughfares, but that the revenue should be reserved to the community at large.

That the whole question should be thoroughly investigated by a Royal Commission.

Mr. Haywood, the engineer and surveyor to the City Sewers Commission, has also reported to his constituents on the subject. Mr. Haywood says:—

"Special consideration will be needed as to how far a company should be allowed to establish what will be, by many, considered a monopoly of portions of the public highways. The objections on this point have, however, been already raised before Parliamentary Committees, but have not been thought, in respect of the Metropolitan and Liverpool Acts already passed, to outweigh the advantages which the schemes possess; but, if very large benefits

are likely to accrue from tramways as well as large profits to the tramway companies, and there are objections to permitting private companies to construct them, it is a question whether Highway Boards should not themselves form such tramways out of the public rates; and this is a fundamental question at the threshold of the whole inquiry."

The subject has since been mooted in the Court of the City Sewers Commission, and after some discussion the principle of the schemes was approved, and the subject has been referred to the Bridge-house Committee.

A report has also been presented to the Metropolitan Board of Works by Mr. Bazalgette, their chief engineer, in which he says:—

"Amongst the most important of the 36 Bills deposited with the Metropolitan Board of Works for the session 1869-70, are those for the formation of street tramways in various parts of the metropolis. They are seven in number, and are called the Metropolitan, North Metropolitan, London, North London, East London, and the Pimlico, Peckham, and Greenwich (two Bills). The aggregate length of these tramways is about 145 miles; the total capital is 1,174,000*l.*, and the borrowing powers 408,500*l.* Most of the principal streets and roads of the metropolis would be, to a greater or less extent, traversed across by these tramways, and in many cases, the occupation of the same street is competed for by different companies—for instance, Tottenham-court-road, Hampstead-road, and Camden-Town-road, are included in these separate schemes, and the Edgware-road, King's-cross, Holloway, Islington, City, Camden, Blackfriars, and Westminster Bridge roads, and Whitechapel and Aldgate High streets, are each proposed to be invaded by two different companies. Four bridges are to be crossed, namely, Blackfriars, Westminster, Lambeth, and Vauxhall. I have on previous occasions expressed the conviction that, 'If tramways are to be adopted in London, it would seem desirable that some uniform system should be laid down under the direction of this Board, rather than it should be left to the discretion and management of private companies, whose interests would be likely to clash with those of the public and with each other.' I am fortified in that opinion by experience of the excessive expenditure which has been incurred in this country by the formation of railways by rival and competing companies instead of having a system of lines selected under some impartial jurisdiction to be executed by private companies; and I am still of opinion that it is undesirable in haste to multiply the tramways of London without having obtained experience as to their efficiency and advantage to the public."

It is to be hoped that Parliament will give the whole question, how best to establish tramways in the metropolis and other large towns, all due consideration before a single Bill is allowed to pass. The subject, we understand, is under the consideration of the Board of Trade. In the House of Lords, Earl Grey questioned the propriety of leaving the proposed tramways in the hands of private companies.

THE OXFORD SLADE PROFESSOR OF ART.

IN Mr. Ruskin's second lecture in the Sheldonian Theatre, Oxford, he said art has a threefold relation to religion. We must consider how far, first, it is literally inspired by religion; secondly, how far exalted by it; and, thirdly, how far it has advanced the creed it advocates. If we analyse imagination we shall find that divine light, of which we all have a share, has affected the creations of all great artists; but the achievements of art have never been the result of inspiration, but of labour and of those feelings which influence all humanity. There are three essentials to all good work of art. 1. An instinct of construction, which is not enjoyed alone by man, but is shared by animals; 2. A faculty of imagination and vision; 3. A power of accurate design. If the second predominate it is usually the result of mental degrangement. An example of this we may see in Albert Dürer's life and death. Some of his visions are unprofitable, unintelligible, and even frightful. A morbid influence spoils his work. This great artist has left us but two works of real didactic value. On the other hand, the best results have been gained by those whose vision was moderated and restrained by accuracy of design. Our best artists are those who are conscious of no divine influence. One of the greatest of them has asserted that all things are possible to well directed labour. Formative art exercises a two-fold influence upon religion. First, in the realisation of conceptions of spiritual persons; 2nly, the localisation of the supernatural presence. Assume, for instance, in the first case the Madonna present to answer prayer: a truly religious mind would desire only so much of her presence as she deigned to give, whereas the superstitious will see before them the actual Virgin. This will affect them in two ways,—first, it will make them believe what they would not otherwise have believed; secondly, it will bring them more frequently under religious influences. The first is evidently mischievous. When art causes us to realise fancy, to believe what is not true, it makes religion degenerate into superstition. If, however, we never lose sight of the fact that it is our imagination which is appealed to, then art is ennobling. The symbolical and realistic are so closely united that in ancient art it is almost impossible to distinguish between them. Now it is easier. It is hard, however, still to say how far symbolical art is improving to mankind. Pictures confessedly imaginary when painted by good men have an elevating tendency, and it is not with these we should find fault, but with the gilded virgins and crucifixes which render superstition a prominent part of the national character. These are pernicious, and to the honour of England their realistic tendencies have been and are discouraged. Lastly, the most notable and lamentable kinds of this injurious tendency is that which encourages people to lament over the sufferings of Christ, instead of alleviating those of his creatures. How much eloquence, music, painting, and sculpture have been wasted during the last 600 years. How is it that, instead of picturing the misery of our Lord, these artists did not remember some of his last words, "Daughters of Jerusalem, weep not for me, but for yourselves and your children." How many women have been led to isolate themselves from the world—to employ themselves in devotions useless to mankind. How much misery might they have alleviated had superstition not perverted their intelligence. One chief reason of the misery of mankind is this division of sympathy with imaginary saints and bad men whose lives ought to have been kept in the background. What might history have been if, instead of living in a cloud of superstition, contention, and revenge, mankind had elevated the good and helped the weak who live among us.

GOVERNMENT WORKS.

SIR,—The more such excellent and practical advice as "T. L. D.'s" is urged on the Government at the present time, so much more will the public at large be indebted to such correspondents. There is no country on the face of the globe that takes so little interest in its public buildings as England. How few public buildings have we worthy of note? How much longer, as your correspondent justly observes, are the public generally to be kept in suspense as regards the New Law Courts, National Gallery, &c.? The sites are provided, and the money paid for them. Here there would be ample means to provide for the necessities of many deserving artificers.

I would not advocate unnecessary extravagance in design for our public buildings, but let them be effective and grand in composition. Who is there that would find fault with Somerset House as a public building? You have fine masses without being overcharged with ornament,—not all adapted to the climate of this country, and which after a few years you find mouldering away, from the effects of soot, and no means of preserving it.

Now, let the Government bear in mind the excellent advice of your correspondent, and at once carry out the designs for the New Law Courts, National Gallery, &c., and provide, or make provision, for so many starving and industrious workmen, and they would secure the good-will of one and all. AN OLD SUBSCRIBER.

SPON'S DICTIONARY OF ENGINEERING.

THIS work, which has attained to the completion of the Second Division, extending as far as, but not yet completely embracing, the section upon bridges and their construction, is now issued by the publishers in the shape of two separate and uniformly bound volumes. From these the design and general character of the undertaking may be well conceived. The present volumes embody the serial numbers of the work in its current and first-projected form of publication, with brief explanatory statements on the part of the editor, Mr. Oliver Byrne, as to the present progress and ultimate scope over which his labours may extend.

The "Dictionary of Engineering" is not ostensibly projected as a work intended to afford new information upon every subject of which it may treat, as its title in a measure could be said to imply. Reference is freely made to works of well-known authority in special branches of engineering practice; but an impress of originality is conferred upon the present work from the manner in which such references are applied, and the criticism to which, in some cases, they have been subjected. From the contents of the present volumes it might more fairly be apprehended that the Dictionary, when completed, will be likely to form a notable, if not the first, attempt towards the classification of the heterogeneous and widely-spread branches of practical science, upon the treatment of which the work is mainly founded, an effort which, upon its own merits, may in the view of many appear commendable, and has long been expressly called for.

As an instance of the general design and character of the subjects which may be successively commented upon, the treatise on agricultural implements, which occurs in the first volume, may be noted. The mechanical details which are here given as to the construction of the various apparatus of novel introduction and usage in farming, well illustrated and described by numerous engravings and diagrams, are followed up by a comparative inquiry as to the advantages and economy arising in the application of steam-motors and machinery in agriculture. Such an investigation is made to enter fairly within range, and the practical exposition which is given in this the first division, although but one of many subjects enlarged upon, of the successful results which have attended the adaptation of science to farming purposes, could not fail to interest a wide circle of readers, and, in certain directions, to be profitably considered.

When the present work was first submitted to notice, the publishers stated that from careful observation, and from classifying the demands made by professional engineers and the scientific public generally for information in relation to numerous subjects that could not be supplied in any convenient form, they were led to entertain the idea that such a work as the one now issued would prove likely to be useful, not only to the experienced engineer, but to all who are in any way interested in the rapid progress which has been made during the past few years in the successful application of the sciences to the arts.

In the list of subjects proposed to be comprehended in the general undertaking are included those of Railway Engineering, Labour-saving Machinery employed in the different industrial pursuits, Practical Mechanics, Naval Architecture, Mining, Telegraphy, and further researches upon the Strength and Properties of the Materials of Construction.

The treatise on Bridge Construction, which forms no inconsiderable portion of the second volume, and which might probably engage more general attention than intermediate subjects, bids fair to constitute one of the leading features of the entire work.

This section will comprise some portion of the volume next to be issued, and, as proving likely to interest some amongst our readers, we have made reference to it, to the exclusion of more specific branches of art of which the work up to its present point of issue already treats.

In the part to which we refer, a masterly investigation is entered upon, comprising incidentally observations upon the general theory of constructive science, but mainly and speedily resolving into an examination of the structural application of iron and steel.

The rival claims of various systems of suspension bridges which of late years have attracted notice might well suggest an important element of inquiry in such a work as that which is now projected, and we are glad to observe—what we do not remember to have before met with in any work of similar character within general reach—that structures of this class, of surpassing magnitude and scientific interest, which have been erected in America, have received something of that prominence to which they are entitled. It would in no way have detracted from the valuable diagrams given in this portion of the book had fuller references accompanied them. They are, however, clearly and well drawn; and to the professional reader, who may be fairly presumed to already possess acquaintance with some of the works described, less chance of incertitude may arise, if they do not prove more acceptable in their present form.

Although it is asserted that much of the materials required to complete this entire work, so that it may present in a concise and concatenated form the latest improvements of professional skill and ingenuity, are scattered through the printed transactions of Mechanical and Engineering Societies, or are to be found in journals devoted to engineering and mechanical pursuits, this portion of the work bears un-

doubted marks of originality, and in a measure which may fairly entitle it to the attention of those who may be interested in that particular branch of the science of which it treats.

The details and general principles of some designs by English engineers are given with illustrations in this portion of the work, including the Charing-cross and Cannon-street railway bridges, designed by Mr. Hawkshaw.

Reference is, however, as yet omitted to more recent works, which may probably be hereafter given, including the important designs which have received the countenance of Mr. Fowler, Sir Charles Fox, Mr. P. and Mr. W. Barlow, and others. The Chelsea suspension-bridge, as well as the elliptical-arched iron bridge at Westminster, both of which were designed by Page, and to which we have had occasion to refer in these columns, have been fairly instanced.

In other portions of the work, no doubt, further references may be appended in relation to recent discoveries in the structural application of iron.

The Francis Joseph Bridge, lately erected over the river Moldau, in Prague, by an engineer of reputation in this country, and to which allusion has been made in various scientific journals, might be well incorporated with the examples already quoted.

After crossing that structure, and walking a little along the bank or rising slopes at the Carolinenthal side of the river, where a view may be obtained uninterrupted by habitations of any kind, it acquires a singular appearance. From the circumstance of the supporting system of chains being composed of steel, the first application, we believe, of that material in so large a capacity, the superstructure seems exceedingly attenuated. The effect is heightened by the novel arrangement of the main-chains, which are disposed in right lines of deflection from the towers to the roadway, intersecting each other towards the centre of the middle span, and designed to be sustained in that position by a curved chain of smaller dimensions, running above their own direction and throughout their entire extent. To this inferior chain the chains supporting the bridge are attached by vertical connexions, of lengths varying with the interval between the curved and oblique chains.

It is considered that the reciprocal action of the main-chains, from end to end of the structure acquired by this arrangement, possesses advantages over bridges supported by continuous chains, as in the Brunel, Barlow, Page, and other systems. Notwithstanding the apparent lightness of the structure, it is stated to embody in the principle greater rigidity than has yet been attained in any like class of erection. While public attention is attracted to the possible application of iron in the erection of railway and other bridges of far greater span than any which have yet been erected in this country,—say, for instance, over the Severn, Mersey, and below bridge on the Thames,—undertakings any of which may be shortly determined upon, and of which it may be said that all are necessary, inquiry upon the merits of later discoveries in the structural use of iron and steel cannot fail to prove of scientific and public benefit.

In taking leave of the present volumes of the "Dictionary of Engineering," at what, though, from the necessity of the case, an interrupted treatise, may upon its conclusion in the succeeding volume prove one of the more attractive portions of the general work, we can fairly commend it as an undertaking of considerable promise.

It will assuredly fulfil the expectations upon which it was projected, in being useful not only to the experienced engineer, but to all who are in any way interested in the rapid progress which has been made during the past few years in the successful application of the sciences to the arts.

Architect to the Conservative Land Society.—The post of architect and surveyor to the United Land Society (Limited), and to the Conservative Benefit Building Society, which was open to public competition owing to the decease of the late Mr. James Wylson, has been conferred by the two boards of directors on Mr. John Ashdown, formerly surveyor to the Orphan Working School and the Hammersmith Bridge Company, and connected with other public works. There were sixty-one candidates for the position.

KING CHARLES I.'S WATCHES.

SIR,—In reply to the question raised concerning Charles I.'s watches in your number for January 1st, your correspondent and others may be interested in knowing that a watch given by King Charles to a member of the Worsley family, at the period of his removal from Carisbrook to Hurst Castle, is still preserved in that family in the Isle of Wight.

This watch is mentioned by Sir Richard Worsley in his history of the island, and by other writers, and is also described by "Vectis" in the *Illustrated London News* for February 7th, 1852.

Through the kindness of one of the family to whom the watch belongs, I am enabled to add the following extract from the will of the Rev. F. Worsley, who held the livings of Chale and St. Lawrence, in the Isle of Wight, from 1754 to 1808:—

"Chale, January, 21, 1856.

"I give my watch, which was given into our family by the great and good King Charles I., of glorious memory, to my son, the Rev. James Worsley, of Billingham, and do most solemnly and ardently request, desire, and enjoin him to do all in his power to cause it to be preserved in the name of Worsley, his own descendants, &c., to the latest generations.

May the gracious God confirm, prosper, and bless my petition and injunction.—F. WORSLEY."

L. H. B.

"THE HEARTHS IN OUR HOME."

THERE is, unfortunately, too much cause for complaint of the manner in which trimmer-arches are constructed for the support of the hearth-stone. The very best brick trimmer-arch is but a clumsy way for supporting the "slab;" it also adds unnecessary weight to the already weakened trimmer-joist. It was to remove these defects that I lately introduced a trimmer-arch of boiler-plate, screwed to the joist, which has answered the purpose beyond my most sanguine expectation. W. J. G.

STATISTICS OF RAILWAYS.

THE INSTITUTION OF CIVIL ENGINEERS.

AT a recent meeting, Mr. Vignoles, F.R.S., President, in the chair, the paper read was "On the Statistics of Railway Expenditure and Income, and their bearing on future Railway Policy and Management," by Mr. John Thornhill Harrison.

Diagrams were exhibited, giving a synopsis of this information for twenty of the principal railways in England and Scotland, which represented about 85 per cent. of the entire capital expended in the United Kingdom. The most striking feature of this traffic was the large numerical proportion of third-class passengers, and, with few exceptions, they yielded the largest amount of revenue. The circumstances which seemed to affect the number of persons travelling first, second, and third class were considered; and whilst it was admitted that each locality required a separate study, it was thought that there were probably some general principles which, with allowances for variable circumstances, might prove useful guides; and it was deduced that where low fares filled the trains, a moderate difference in them effectually sorted the passengers, and tended to increase the demand for first and second class tickets for long journeys.

On the question of the further extension of railways, it was urged that many lines might be constructed at a cost of from 3,000*l.* to 5,000*l.* per mile, provided the landowners would sell their land for the purpose at the ordinary market value, that the Board of Trade would allow level crossings, and that gradients as steep as 1 in 20 or 1 in 30 were adopted.

Attention was directed to the striking similarity on the different lines of the per centage of expenditure on the gross receipts, which averaged about 48·4 per cent., and the combined expenditure for maintenance, rolling stock, and locomotive power, which generally exceeded 50 per cent. of the total expenditure, the other heavy item being about 30 per cent. for traffic expenses. The total locomotive charges were generally from 8d. to 9d. per train mile. The repairs amounted to about 3½d. per train mile, when the mineral traffic was heavy, and from 2½d. to 3d. on the passenger lines south of London. Under the head of running expenses, the item of wages was strikingly similar on all the lines, being about 2½d. per train mile. The cost of fuel per train mile varied greatly. On the southern lines, where the consumption was small, the cost was 3d. or 4d. per train mile, whilst on the northern lines, where the consumption per train mile was large, but the price was small, it was only about 2d.

The per centage of net revenue on the total capital expended exceeded 5 per cent. per annum on eight lines; was between 4 and 5 per cent. on four; 3½ to 4 on other four; 3 to 3½ on two; and only in two cases was it under 3 per cent. This per centage was influenced by the cost of construction and the character of the traffic, and showed the importance of their consideration. The amount available for dividend was dependent on the per centage on the total capital. When this per centage fell below 4½ per cent. the stockholders' dividend was diminished to supply the deficiency, and *vice versâ*; it depended most on the burdens to be borne; but where lines could *bonâ fide* pay all their engagements, and have a surplus to divide, the elasticity of the railway system seemed to promise at an early date a fair rate of dividend.

Two large funds for investment of capital were next considered: the national debt, which amounted to 750 millions sterling, and gave a return of 26½ millions per annum, or 3½ per cent., which was a burden on the industry and capital of the country; and the capital expended on railways, which amounted to 500 millions sterling, giving a return of 20 millions, or 4 per cent., per annum; whilst a sum nearly equal to the interest on the national debt was annually expended in labour and materials.

It appeared that 54 per cent. of the railway capital had been expended since 1849, in which year it amounted to 228,747,779*l.*; whereas in 1867 it was 502,262,887*l.* The length of railways in operation had been more than doubled, being 6,032 miles in 1849, and 14,247 in 1867. The length of double line was increased from 5,034 to 7,844 miles, or 56 per cent.; whilst the single lines had been increased 542 per cent., or from 998 miles in 1849 to 6,403 miles in 1867. Notwithstanding this, the cost per mile was maintained at from 33,000*l.* to 36,000*l.* per mile. This was explained by the general traffic having increased 240 per cent., and the goods traffic 400 per cent.; whilst the capital expenditure was only 120 per cent. This augmented traffic demanded extensive increase of rolling-stock, sidings, and station accommodation, especially for goods. The traffic was still largely on the increase, and this would necessarily delay the closing of the capital accounts, which was desirable.

The burdens on railway property, as they affected the original shareholder, and the proposals for relieving these burdens to some extent, were next considered. One of these proposals was, that Government should take upon itself the responsibility of the loan capital at an equitable price; and it was argued, that as they could borrow money at a low rate of interest, they might benefit the railway companies and the public by an arrangement for gradually extinguishing the loans and reducing the fares and rates.

RUSSIAN MEMORIAL CHURCH AT SEBASTOPOL.

LETTERS from Sebastopol say that the Church of St. Nicholas, erected in memory of the Russian soldiers who fell in the Crimea, and dedicated to St. Nicholas the Wonder Worker, will be consecrated in May. The foundation stone was laid in 1856, close to the cemetery known as "The Cemetery of the Hundred Thousand," and the Church of St. Nicholas, already completed as a building, will, when it has been fully decorated, be the most magnificent religious edifice in the South of Russia. The contributions to the building fund from all parts of Russia have been immense, the largest offerings being those of the Princess Vassiltchikoff, widow of the late President of the Council of the Empire, who is an annual subscriber to the amount of 15,000 rubles. The church is paved with granite taken from the ruins of Sebastopol docks. The walls are, for the most part, of grey marble from the Crimean quarries. The cross and windows are formed of a Crimean stone called atonite, while for other portions of the interior green, black, and fawn-coloured diorite is employed. Above the entrance is the face of our Saviour in mosaic, and sunk into the outer walls of the church are large slabs of marble bearing the names of all the officers who fell in the war. The left wall is dedicated to officers of marine artillery, of cavalry, and of infantry;

the right wall to officers of engineers, of the staff, of the navy, and of cavalry and infantry. Connected with the church is a memorial chapel, containing portraits of about two hundred of the principal actors in the war, including the Emperor Nicholas, the Emperor Alexander II., and the Grand Dukes Constantine and Michael. "Pilgrimages," says the *Gazette of New Russia*, "will be made to the Church of St. Nicholas from all parts of the empire, and there will be an enormous gathering to witness the consecration of the building; for who did not lose a relation in the Crimean war, and who will not wish to visit the grave of his father or his brother?" It would seem, then, that the memory of the Crimean war is cherished by the vanquished.

HARROGATE.

SIR,—With regard to the progress of Harrogate mentioned in the *Builder* of Saturday, the 19th, and especially with regard to the competition plans of the Public Rooms Company, I have, on behalf of Messrs. Shutt & Thompson, and myself, to say that, although the directors knew we were waiting outside to explain our plans, we were never invited to do so. I enclose you two paragraphs from Harrogate papers, showing that this circumstance is being canvassed.

RICHARD DYSON.

WAGES IN MANCHESTER.

A JOINER'S CLAIM FOR WAGES.

A CASE that interested the joiners and carpenters of Manchester was decided by Mr. Headlam at the city police-court. John Johnson, builder, was summoned by a workman, named Edward Bennion, for the sum of 5s. 11d. as wages due.

Mr. Bent, in opening the case for the complainant, said that during the previous summer there was a considerable dispute in the building trade, with reference to the wages paid the workmen; but it was finally settled by Mr. Kettle as arbitrator. It was then decided by certain of the masters on behalf of the building trade, and certain parties on behalf of the workmen, that 7½d. per hour should be paid from May, 1869, to May, 1870. That, of course, became a rule of the trade, and when a man was engaged it was understood he was hired on these terms except the contrary was stated. In this case the complainant, with twenty others, were engaged by Mr. Johnson on the 24th of January last, but no mention was made of wages. At the expiration of the first week's work, the complainant only received 30s. 4d. instead of 33s. 7d., and said to the cashier it was not at the rate of 7½d. per hour, whereupon the cashier replied, "Oh, it is all right; we shall make it right next week." On the following Saturday the complainant again only received the 30s. 4d., which he took under protest, and he and fourteen others then left Mr. Johnson's employ.

For the defence it was contended that the complainant did not possess the "average skill"—a provision of the rule laid down by the arbitrator, and therefore was not entitled to the full wages of skilled artisans.

After hearing some further evidence, Mr. Headlam gave an order for one half the amount claimed.

HOUSE AGENTS' RESPONSIBILITIES.

STINTON *v.* CURTIS.

THIS was an action (Court of Exchequer, February 19th, Second Court, before Baron Martin) brought by a widow lady against a house agent for alleged negligence in letting her house to a person who was unable to pay the rent. The defendant pleaded several pleas, which in substance denied that he had been guilty of any negligence.

Mr. Oppenheim appeared for the plaintiff, and Mr. M'Intyre for the defendant.

It appeared that the plaintiff is a widow lady residing at 3, Langham-street, Langham-place, and the defendant a house agent, carrying on business at Langham-place. In May, 1868, the plaintiff employed Mr. Howe, the then partner of the defendant, but who has since died, to let her house for some months, on the condition that the first two months' rent, amounting to 35*l.*, was to be paid in advance before the tenant was to be allowed to take possession. According to the plaintiff's case, the defendant negligently allowed a person to take possession of the plaintiff's house without paying the rent, which she had since been unable to recover. She now brought this action to recover the 35*l.* she had so lost, as well as certain expenses to which she had been put in the matter.

The defence was, that the person in question had improperly obtained possession of the plaintiff's house, and that therefore the defendant was not responsible.

The jury returned a verdict for the plaintiff,—Damages, 30*l.*

RESISTANCE TO FIRE.

SIR,—As a means of preventing the destructive ravages of fire, especially desirable in offices, libraries, art repositories, picture galleries, and other premises, I beg to advise that the plating of roofs with sheet-iron plates, be adopted, as fires thereby would almost certainly be confined to the apartment they originate in, by reason of the obstacles to the progress of fire by the sheet-iron roofing. The plates could also be laid as shutters for libraries, and in picture galleries, and be made to fold or slide away, from place to place, as required. The complete adoption of iron plates being laid for the protection of roofs of domestic house lower apartments, would probably result in the saving of valuable lives and properties, and reduce insurance fees, to such an extent as to pay interest for the extra cost in building houses, offices, and warehouses, guarded with sheet-iron plates. The surface of the plates would allow plastering, painting, and paperhanging to be used as now, and if necessary punctures through the plates into the woodwork they are fastened to, could be made for any purpose. As a desirable measure for adoption, I beg to ask your consideration hereof.

For ships and steam-vessels, the light extra expense of the iron-plating, should be worth notice to adopt it, to prevent calamities: a little time gained by opposing the fire may end in saving life through aid arriving.

PROGRESS.

*** Similar propositions have been made and carried out again and again,—slates, extra thick plastering put at the upper and underside of the laths, &c. We print the letter simply as reminder, and to keep under attention the desirability of improved construction in the direction of incombustibily.

THE PIPE-LAYING CAT.

THE pretty tale is well known of a prisoner who made a spider's web serve to draw up a fine thread, the thread a string, and the string a rope strong enough for him to escape by. We have just now heard a little story of a cute young Yankee in Lisbon, Ct., which may go with this. He wanted to lay a water-pipe through a drain several feet below the surface without digging up the drain; so what did he but tie a string to a cat's leg, thrust her into one end of the drain, and gave a terrific "S'cat!" The feline creature, thus made a cat's-paw, and dreading a catastrophe or cataclysm, quickly rushed through the other end, as if from a catapult or cataract. The pipe was drawn through by means of the string, and 10 dollars were saved by the transaction;—a categorical result entitling this cat of the catacomb to be included in the next catalogue of labour-saving machines.

Books Received.

Our Domestic Fireplaces: a New Edition. By FREDERICK EDWARDS, Jun. London: Longmans, Green, & Co. 1870.

THIS is a much improved and enlarged edition of a work already noticed by us in past years. It has been entirely rewritten, the additions completing the author's contributions on the domestic use of fuel, and on ventilation.

In his first chapter the author gives an interesting sketch from various sources, of much relating to the history of the fireplace. In the second he details the progress made in this country during the present century. In the third, he enters into the details of various improvements which are possible at the present time, or may become practicable in the future. In the fourth he takes up the subject of stoves and other means for effectually warming the halls and other portions of dwellings, which are now in a great measure disregarded by builders, whom some ignorant critics, we may here observe, in charging them with ignorance or stupidity, speak of as "the lower classes of architects;" whereas architects of any class have too often nothing to do with the construction or arrangement of "our domestic fireplaces."

The volume is illustrated by numerous plates of grates, stoves, and other fireplaces, hot-water apparatus, &c. A portrait of Count Rumford forms the frontispiece.

The author thus states his views of what could be accomplished by hot-water circulation:—

"At one end of a line of houses boilers and furnaces could be fixed, and from the boilers hot-water circulating pipes, protected to prevent loss of heat, could pass in proximity to the houses. From such main circulating pipes, branch pipes, also protected, could enter each house, and ascend to any height required, with branches for drawing off water for baths and other purposes, and with other branches which would admit the water to circulate, when required, through hot-water coils for warming the house. That there would be any insuperable difficulty does not appear for a moment. The extent to which hot-water circulation has already been applied is a sufficient proof of its possibility. Competent persons could be as readily found to manage such a system as to make gas or to drive a railway train. The contingencies of a temporary failure of supply would be simply met by every house having the means of falling back upon something provided, just as we can substitute candles for gas. And, with respect to economy and efficiency, it is not possible to conceive how any system could be more economical, due care being taken in all matters of detail, or more efficient, inasmuch as the constant attention of a skilled person should adapt the system, to some extent, to the demands of the thermometer. Irrespective of this, there would be ample facilities of regulation left in the hands of the occupier."

Marvels of Architecture, translated from the French of M. Lefèbre. To which is added a Chapter on English Architecture. By R. DONALD. London: Cassell, Petter, & Galpin.

THIS is a pretty little book, very readable, and likely to interest many in what architecture has done. It is not intended for the professional student. The chapter on English Architecture is the least satisfactory part of the volume, and further confirms what we recently said as to its being desirable that persons who write about buildings should know something of architecture. Take an instance in proof. The author is speaking of "the Gothic style of architecture which sprang into ascendency during the Middle Ages," and says,—

"The style is also widely known as the *Pointed* style of architecture, and is very largely to be found in the *Saxon and Norman* edifices of this country. What is known as the *Corinthian order* of Pointed architecture is, indeed, almost peculiar to England."

Very peculiar indeed, we should say. Again,—

"Though the Gothic and Pointed styles are often confounded, there is considerable distinction between them. In Gothic, the general running lines are horizontal, as in entablatures and single cornices; in Pointed, the general running lines are vertical."

The author is evidently at sea. Nevertheless, it is an interesting little book: and it includes a considerable number of illustrative woodcuts.

VARIORUM.

"A GUIDE to the Churches of London and its Suburbs, for 1870." By Charles Mackeson. Parker, Strand. In this fifth issue of a very useful guide some improvements have been effected, as in the consecutive numbering of the alphabetical list of churches, so increasing the utility of the index. Another little improvement we would suggest. Although the guide is an alphabetical one, there is no alphabetical entry whatever of St. Paul's Cathedral, of Westminster Abbey, nor of the Royal Chapels, under any heading. This is certainly a defect. The reason of it is, that these churches and chapels are all placed at the head of the alphabetical list, which latter begins with "9. Alban, S., Holborn," without even a short rule to separate it from the last of the royal list, which is, "8. Chapel within Hampton Court Palace." Let the preferential list remain, by all means; but why not insert references to it in the proper alphabetical order?

Miscellanea.

Destruction of St. John's Church, Bethnal-green.—A fire has destroyed the district church of St. John, situated at the south-western corner of Bethnal-green. It was a capacious edifice, with sittings capable of affording accommodation for over 2,000 people. Workmen had been employed for some time in enlarging the illuminated clock in the steeple, and it is supposed that the fire arose through carelessness on their part; for, about seven o'clock p.m., a glare of light was visible in the steeple, and in a short time the flames burst forth through the clock-turret. Some seven or eight steam fire-engines soon arrived, but unfortunately no supply of water could be obtained for a considerable time. The firemen conveyed the hose into the interior of the church, but their efforts were frustrated from the cause referred to. The flames soon spread to the roof, and by half-past eight the whole of the building was in flames. It was not until that time that the engines could get a supply of water. Portions of the roof had fallen in, and set fire to the pews, in the galleries as well as in the body of the church. The fire continued to rage till ten o'clock, by which time the church was almost entirely destroyed. The parish church of Bethnal-green, in Church-street, was burnt down only a few years since.

Geographical Medal and Award to M. Lesseps.—At the general meeting of the French Geographical Society just held, M. Barbié du Bocage, reporter of the committee to award the Empress's Grand Prize of 10,000 francs, given this year for the first time, announced that the award of that body had been in favour of M. Ferdinand de Lesseps, who, by cutting through the Isthmus of Suez, had accomplished the work most useful to the commercial relations of France. M. de Lesseps received from the president the medal which accompanies the prize, and announced that he would devote the sum of money to the expedition which the society is about to undertake into Central Africa.

The Drainage of Margate.—The articles that have from time to time appeared in our columns on the cesspool system at this very favourite watering-place, have had effect, we learn, on some of the freeholders of the town, if not upon the local Board of Health, and an extensive system of tubular earthenware pipes is now being laid throughout the whole of the large block of houses known as the Royal Crescent Estate. The works are being carried out by Messrs. Docwra & Son, of Islington, from plans prepared by Mr. W. Lane Sear, of Margate, architect.

Accidents.—A destructive fire has occurred in Newcastle, Atkinson's saw-mills having been burned to the ground, and 8,000*l.* worth of property thereby destroyed. There was a strong wind blowing, and no water was obtainable for a considerable time. This is the second saw-mill burned down in Newcastle within a month.——At midnight, on Friday week, the inhabitants of the Boulevard Jourdan, at Marseilles, were aroused by the noise of a terrific crash, which was discovered to have been caused by the falling in of two contiguous houses. After an hour and a half's work, eight men, all still living, but very seriously injured, were extricated, and exertions were being made to discover a young man and woman, who were known still to be beneath the *débris*.——The *North German Correspondence* reports that at about two o'clock in the morning recently, a rather alarming fire broke out in the upper part of the Palace of the Prussian Crown Prince, just above the apartments of the Princess Charlotte, the ceilings of which were partially consumed by the flames. The young Princess having been removed to another portion of the building, the fire was soon extinguished by the exertions of the fire brigade. The fire is believed to have been caused by a coal or spark from a chafing-dish with which some workmen, the day before, had been trying to thaw the frozen water-pipes.

House of Commons.—In answer to Mr. Locke King, Mr. Ayrton said that, owing to arrangements between the Government and the Metropolitan Railway, the subway projected some years ago from Parliament-street to Palace-yard could not be completed as originally proposed. He had, however, been in communication with the Metropolitan Board, and he had urged upon them the propriety of connecting the subway with the Embankment.—— Mr. Cowper-Temple asked whether the Government are prepared to take measures for relieving the overcrowded condition of the objects placed for exhibition in the British Museum by means of the erection of a new building for the collections of natural history. Mr. Ayrton, in reply, said the Government had the subject still under consideration.——Mr. Samuda also has given notice to ask whether, before the Government approve of the site that may be selected by the Corporation for the waterside market for foreign animals, means will be taken to ascertain the views of those interested in the trade, and to insure a sufficient extent of accommodation being provided.

A Caution.—It ought to be pretty well known by this time that the copyright of Mr. Maclise's grand pictures, "Wellington" and "Nelson," in the Royal Gallery, at the Houses of Parliament, was purchased by the Art-Union of London, and that engravings are in course of active preparation for distribution. It takes a long time, however, to make such facts known, even in circles supposed to be well informed on such points. Thus Messrs. Ward & Lock had reproduced for publication, as a chromolithograph, the centre portion of the Wellington picture, and were about to publish it. On receiving notice, however, from the Hon. Solicitor of the Art-Union that the society would maintain its rights, those gentlemen at once expressed regret for having unwittingly done wrong, and forwarded all the impressions, some 3,500 in number, to be destroyed. Great credit is due to Messrs. Ward & Lock for their prompt acknowledgment of error. We mention the occurrence simply as a caution to other publishers.

The Railway for Japan.—A contract for the construction of a railway has been concluded by Mr. H. N. Lay, C.B. He represents capitalists who have entrusted him with money to be lent to the Japanese Government for the construction of reproductive public works, and he advances one million sterling to the Japanese Government for a line from Yedo to Osaka, some 300 miles, to be built by English engineers. The railway will be the property of the Government.

Ramsgate.—The New Cemetery.—The contracts for building the chapels, lodge, walls, &c., have been received by the board, and Mr. Wilson, builder, of Canterbury, is the accepted contractor for the erection of the chapels, for the sum of 1,882*l.* Mr. Duckett's tender for the lodge and wall, at a sum of 2,400*l.*, was accepted; but a letter was read from Mr. Duckett, to which the clerk was instructed to reply, and inform him that the board was not prepared to entertain the proposals contained therein.

The Alexandra Palace.—At Crouch-end Mr. Francis Fuller lately gave an address on the advantages and capabilities of the Alexandra Park and Palace, to a crowded meeting, desirous to hear what was to be done with the Palace. Mr. Fuller, according to the report in the *North Londoner*, said:—

"The British Museum was established by lottery, and he meant to have the Alexandra Palace established in a similar manner by the Art-Union system. He would not have it an exhibition of painting and sculpture solely, but of every article of use and ornament, that it might serve as an encouragement to trade as well as for instruction. The value of the palace and grounds was 650,000*l.*, which he proposed to deal with on the Art-Union and Tontine systems combined. He would collect in the palace 100,000*l.* worth of prizes, and have a distribution every three years. Mr. Webster, Q.C., proposed that a committee be formed in the locality to assist Mr. Fuller in his object, which was unanimously agreed to. In reply to a question, Mr. Fuller said he was working in union with the owners of the property, and they had fixed the price at which they were ready to dispose of it."

Mr. Fuller commended his project to the consideration of the residents.

The Water Supply of the City.—At a meeting of the Court of Common Council, to be held this day (Thursday), a motion is to be proposed by Mr. Deputy Stapleton, to the effect that having regard to the report of the Royal Commission, the question of the supply of water to the inhabitants of the City be referred to a committee, for them to inquire and report forthwith to the court as to whether it will be to the advantage of the public that the interests of the existing water companies should be purchased, and that the subsequent management should be vested in the corporation. At the same court Mr. Cockerell will bring up a report from the coal, corn, and finance committee, recommending that the sum of 1,200*l.* be expended in erecting a drinking-fountain in Smithfield, and that the corporation undertake to expend the sum of 50*l.* annually to supply it with water.

Finsbury Park.—Mr. Vulliamy, superintending architect to the Metropolitan Board of Works, estimates the expenses of this park during the year 1870 to be as follows:—General superintendent, 50*l.*; park superintendent, 104*l.*; gardeners, twelve, at 21*s.* each per week, 655*l.* 4*s.*; hire of horses for rolling and mowing machines, average 2*l.* 14*s.* per week, for twenty-six weeks, 70*l.* 4*s.*; repairs to machinery, lodge, &c., 25*l.*; repairs to fences, roads, walks, and gates, 100*l.*; manure, 100*l.*; trees, shrubs, grass-seeds, and lake, 100*l.*; water, at 7½*d.* per 1,000 gallons (800,000 gallons), 25*l.*; gas, 4*l.*; land-tax, 2*l.* 11*s.* 4*d.*; poor-rates, 50*l.*; tithes, 1*l.* 18*s.* 4*d.*: total, 1,287*l.* 17*s.* 8*d.*

The Holborn Board of Guardians.—At a recent meeting a letter, dated the 3rd inst., was read from Mr. F. Peck, architect, inclosing a communication which had been addressed to him by Messrs. Batstone & Hunt, as follows:—"Finsbury Schools. Dear sir: In May last we sent you a statement of our charges, amounting to 284*l.*, for preparing the quantities of the district schools, &c. Hoping you will soon obtain a cheque for us, we are, &c." Mr. Peck, the architect, also claimed 630*l.*, in regard to preparation of plans, and 3 per cent. upon work undone, for which, if carried out, he would have received the usual commission of 5 per cent. Consideration of the matter was deferred.

Manchester Ship Navigation.—Considerable interest has been excited, it is stated, respecting this subject, and it appears that the conclusion at which practical men who have fairly considered the matter have arrived is, that the proposed plan is quite practicable; and that Manchester and other capitalists are prepared, if the Mersey and Irwell Navigation proprietors are willing to give their earnest co-operation, to contribute funds in order to advance the undertaking. A survey is proceeding, it is said, under the direction of Mr. Fulton, engineer, and upon the result of his investigation will much depend the progress of the undertaking.

The Education Bill.—The Elementary Education Bill, introduced by Mr. Forster and Mr. Bruce, has been printed. It fills twenty-six pages, and contains eighty-eight clauses. It is divided into two parts; the first, which extends to the 81st clause, relates to "Local provision for schools," and the second to the "Parliamentary grant." There are four schedules attached to the Bill, one of which lays down rules respecting the election of school boards, and another directions for the conduct of its proceedings.

The Cambridge Slade Professor.—The Slade Professor of Fine Arts in the University of Cambridge (Sir Digby Wyatt) proposes to deliver a course of thirteen lectures, as follows:—1, Introductory, March 9th; 2, Architecture, History, March 14th; 3, ditto, Theory, March 15th; 4, ditto, Practice, March 16th; 5, Sculpture, History, March 28th; 6, ditto, Theory, March 29th; 7, ditto, Practice, March 30th; 8, Painting, History, May 2nd; 9, ditto, Theory, May 3rd; 10, ditto, Practice, May 4th; 11, Art applied to Industry, Ancient, May 20th; 12, ditto, Modern, May 21st; 13, Facilities at Cambridge for the Study of the Fine Arts, May 23rd. The lectures will be delivered in the Fitzwilliam Museum at 2.15 p.m., with the exception of the introductory lecture, which will be delivered in the Senate-house at 2.30 p.m.

London House Painters' Association.—The society that was formed, as we have before mentioned, some months ago, under the title of the London House Painters' and Decorators' Technical Instruction Association, and having its head-quarters at the London Artisans' Club, 73, Newman-street, continues its classes at the Marylebone School of Art, in Bolsover-street; and, considering the very depressed state of the building trades, the association has been fairly supported. On Wednesday evening in last week the members adjourned to the large hall of the German Club, in Foley-street, to hear a lecture by Mr. John G. Crace, "On Art Training," Mr. Edward Hall in the chair. At the conclusion the meeting was addressed by Mr. Lamport, Mr. Shipton (the secretary), and others.

The Restoration of Chester Cathedral.—A meeting has been held in Liverpool for the promotion of the further restoration of Chester Cathedral. Of the 55,500*l.* stated by Mr. Scott to be requisite for the complete restoration, the Dean stated that works to the extent of 31,500*l.* had been secured by subscriptions and expended on works, with the exception of 7,000*l.*, now in the bank. The roofs and the interior groining of the nave were now under consideration. A special additional fund of 5,000*l.* for the groining, &c., while the scaffoldings were up, was now requisite. The whole work could not be completed within three years. The meeting was intended as a preliminary to one appealing to Lancashire in particular for aid.

The International Safes Contest.—Trade jealousies still keep up the excitement on this subject. The two American arbitrators and the French one having decided the contest in favour of Herring, the American, without the two English arbitrators, who had resigned in consequence of what they considered not very honourable conduct on the part of the Americans, an action in the Tribunal of First Instance, was commenced by Herring against Chatwood, the English lockmaker, and Tagnard, the stakeholder, and after three days' trial, has terminated by a judgment declaring the so-called award null and void, and condemning Herring in the costs.

St. Mary's Church, Torquay, South Devon.—A vestry meeting was held in this parish on the 16th inst., to consider the proposal to complete the church by building the tower in accordance with the plans prepared by Mr. Hugall, of Oxford, under whose direction the church has thus far been erected,—the first portion, the chancel and chancel aisles, by the late Mr. Thos. Darby, of Cheltenham; and the nave, north and south aisles, and porch, by Messrs. Wall & Hook, of Brimscombe. It was decided that it is desirable to complete the church at a cost of 2,700*l.*, and a committee was appointed to collect funds.

Easter Island.—At a meeting of the Society of Antiquaries of Scotland, held on Monday week, Lieut. M. Dundas read a communication on "Easter Island: its Inhabitants, Antiquities, and Colossal Statues." In the course of conversation with reference to Lieutenant Dundas's paper, Dr. Smith mentioned that a previous visitor of the island had found old graves almost exactly identical with those found in the Hebrides and in Shetland.

Value of Land, Derby.—The local papers say that the piece of land at the corner of St. James's-street, fronting the Corn Market, has been sold by the Derby Improvement and St. James's Hotel Company, to Mr. Randall, at 30*l.* a yard, subject to the approval of the directors who did not take part in the negotiation.

Bristol Corn Exchange.—Correspondents from Bristol say that Mr. E. M. Barry, who was consulted with reference to the proposed covering of the quadrangle of the Exchange, has sent a report, accompanied with two plans, which were presented to the committee at their last meeting. The first plan would cost about 2,700*l.*; but that he did not recommend to be adopted, nor did the committee think it would be acceptable. By the second plan, the present pillars supporting the arcade are to be removed and replaced by more ponderous ones, of the Doric style of architecture, set farther back. Above these the existing pillars will be erected so as to form a second row, advancing more towards the centre of the Exchange, and supporting an illuminated cupola. The cost of the latter plan would be about 4,000*l.*

Norfolk and Norwich Archæological Society.—The annual [illegible] of this society has been held at the G[illegible]. Upon the table were a nu[illegible] objects, and there were also [illegible] inspection of the members so[illegible] the Loddon Church screen, allude[illegible] paper by Mr. L'Estrange. The hon. [illegible]tary, Mr. C. R. Manning, read the report, after which, office-bearers were elected or re-elected. The Rev. C. R. Manning then read a paper contributed by Mr. H. Harrod, "About Norwich Thieves in the Thirteenth Century;" and Mr. Fitch one from Mr. L'Estrange on Loddon Church.

Dockyard Men.—We understand that great consternation was occasioned (and no wonder) on Monday morning, at the Devonport Dockyard, by orders from the Admiralty expediting the discharge of workmen, and that forty-one were sent away on Saturday last, without a day's notice, before the arrival of their pension papers.

Effects of Criticism.—It has been currently stated, that of the two architects who were concerned in the erection of the recently-completed opera-house in Vienna, and which was somewhat severely criticised, one jumped into the Danube, and the other hanged himself. We should be glad to have the correctness or otherwise of this story certified.

Cottage Gardens and Window Gardening.—Forty essays have been sent to the Horticultural Society in competition for the prizes offered by Mr. W. Egerton Hubbard, jun., for the best essays on the management of cottage gardens and window gardening. It is intended to have the best essay printed in the plainest possible form and circulated among the various cottage gardens in the country.

Polytechnic Institution.—We are glad to see that the terrible rubbish which was called "The Mysteries of Udolpho," has been given up. Some very agreeable entertainments have been substituted.

Surveyor for Leamington.—Mr. Davidson, a surveyor, late in the service of the Manchester Corporation, has been elected surveyor to the Leamington Local Board of Health.

The Literary Fund.—Lord Dufferin will preside at the next annual dinner of this corporation, which is fixed to take place, on Wednesday, the 11th of May, at Willis's Rooms.

A Memorial Cottage Hospital.—It is proposed to erect a cottage hospital at Shaftesbury as a memorial of the late Marquis of Westminster.

Royal Society.—General Sabine will hold his first *conversazione* of the present season at Burlington House, on Saturday, March 5th.

Portraits.—The portrait we give in our present number, was drawn from a photograph, by Mr. John Watkins, of Parliament-street.

TENDERS.

For alterations and additions to Hailsham Union. Mr. C. Berry, architect:—

Coleman	£2,500	0	0
Stonstreet	2,373	1	2
Aviss & Roe	2,270	0	0
Pitcher	2,038	0	0
Punker	2,000	0	0
Harman	1,985	0	0
Peerless	1,941	0	0
Thompson	1,935	0	0
Card & Son	1,930	0	0
Fuller & Co.	1,926	0	0
Skinner	1,885	0	0
Piper & Co.	1,881	0	0
Mosling & Sons	1,850	0	0
Blackmore	1,735	0	0

For new Grammar School, Reading, Berks. Mr. Alfred Waterhouse, architect:—

Cleasy	£24,906	0	0
Gregory	24,878	0	0
Doverwood & Co.	23,798	0	0
Woodrough	23,768	0	0
Brass	23,495	0	0
Matthews	23,212	0	0
Hibbard	22,959	0	0
Pollard	22,384	0	0
Wheeler	22,292	0	0
Bays & Rammage	22,000	0	0
Stains & Son	21,976	0	0
Cowland	21,840	0	0
Simpson	21,765	0	0
Colls & Son	21,746	0	0
Jackson & Shaw	21,741	0	0
Mansfield & Price	21,555	0	0
Macey	21,384	0	0
Gibson, Bros.	21,178	0	0
Horseman	21,486	0	0
Walton, Bros.	21,427	0	0
Perry & Co.	20,915	0	0
Woodbridge	20,730	0	0
Blackmore	20,574	0	0
Holland & Hannen	20,484	0	0
Jones	19,950	0	0
Kirk & Parry	19,905	0	0
Wright & Co.	19,895	0	0
Dimment	19,385	0	0
Bull & Son	18,900	0	0
Parnell & Son	18,707	7	7
Clarke	17,831	0	0

For re-roofing twelve cottages at Wonford, near Heavitree, Devon, for Mr. J. Scudder. Mr. Charles Pinn, architect. Quantities supplied:—

Gardiner	£270	0	0
Easton	226	0	0
Harris	220	0	0
Smith	210	0	0
Westlake	209	0	0
Stephens	205	0	0
Scadding (accepted)	201	0	0

For Archbishop Tenison's new schools, about to be built in Leicester-square, on the site of the old Sablonière Hotel. Mr. F. Marrable, architect. Quantities by Mr. W. F. Meakin:—

Nixon & Son	£4,616	0	0
Clemence	4,481	0	0
Longmire & Burge	4,424	0	0
Mansfield & Price	4,405	0	0
Howard	4,379	0	0
Dove, Brothers (accepted)	4,375	0	0

For the St. Martin's Parochial School for girls, to be erected in Castle-street, Leicester-square. Mr. F. Marrable, architect. Quantities by Mr. W. F. Meakin:—

Nixon & Son	£3,440	0	0
Longmire & Burge	3,319	0	0
Mansfield & Price	3,280	0	0
Clemence	3,274	0	0
Howard	3,187	0	0
Dove, Bros. (accepted)	3,175	0	0

For various alterations, &c., to premises, 24, Crutched Friars. Mr. R. C. Harrison, architect:—

Colls & Sons	£2,283	0	0
Browne & Robinson	1,995	0	0
King & Sons	1,859	0	0

For alterations and additions to The Poplars, West Bromwich, for Mr. T. B. Salter. Messrs. Nichols & Chamberlain, architects:—

Fisher	£449	0	0
Wilkes (accepted)	443	10	0

For the erection of infants' and girls' school, with mistresses' residence, Walsall, for the committee of St. Peter's parish. Messrs. Nichols & Chamberlain, architects:—

Briley	£1,625	0	0
Wilkes	1,540	0	0
Jeffrey & Pritchard	1,482	0	0
Trow & Sons	1,473	0	0
Hitchin, Bros.	1,450	0	0
Nelson	1,440	0	0
Fisher	1,391	0	0
Thompson	1,370	0	0
Taylor	1,349	0	0
Stockton & Son	1,343	0	0
Rowley	1,300	0	0
Adkins*	1,274	10	0
Holland, Bros.	1,270	0	0

* Reduced estimate accepted, £1,193 15s.

For alterations and additions to The Cedars, Winchmore-hill. Mr. J. W. Dobson, architect:—

Cheffin	£1,028	0	0
Wood, Bros.	995	0	0
Rivett	953	0	0
Read & Son	825	0	0
Wicks & Bangs	785	0	0
Ward	764	0	0
Ennor	748	0	0
Patman, Bros.	735	0	0

For erecting the chancel, nave, and aisles of St. Stephen's Church, Villa-street, Walworth. Messrs. H. Jarvis & Son, architects:—

Downs	£6,546	0	0
Marsland & Son	6,400	0	0
Thompson	6,327	0	0
Henshaw	6,082	0	0
Merritt & Ashby	6,000	0	0
Higgs	5,983	0	0
Carter	5,870	0	0
Barlett	5,845	0	0
Longmire & Burge	5,804	0	0
Colls & Sons	5,784	0	0
Dove, Bros.	5,649	0	0
Myers & Son	5,419	0	0
Tarrant	5,186	0	0

For new rectory-house at Cotehill, near Weatherall, Cumberland, for the Rev. John Howard. Messrs. E. Habershon & Brock, architects:—

Court (accepted)	£1,417	0	0

For a small conservatory at The Cedars, Basingstoke, for Mr. R. A. Davis (exclusive of heating):—

Norman & Co.	£190	0	0
Cumming & Edmunds	176	0	0
Preedy & Son	160	10	0
Glover	159	0	0
Lewis	159	0	0
Lammie & Co.	158	0	0
Jennings	155	0	0
Duke	155	0	0
Palmer	153	1	6
Woodbridge	153	0	0
Stevens	148	0	0
Wilks	145	5	6
Simmonds (too late)	144	0	0
Pistell (accepted)	126	0	0

For alterations and additions to Ripley House, Ripley, Surrey. Mr. James K. Colling, architect:—

Hills	£1,875	0	0
J. & A. Wright	1,575	0	0
Spicer	1,574	19	0
Jarrett	1,487	0	0
Harris	1,475	10	0
G. & J. Wood	1,470	0	0
Farley	1,365	0	0
Saunders & Beevers	1,360	0	0
Todd & Sanders	1,225	0	0
Lammie & Co.	1,163	0	0

TO CORRESPONDENTS.

J. E. O. (cancelled. We do not desire to print letters sent to half a dozen papers).—A Shoemaker not Shod (not clear. State a case to illustrate).—Architectus (observation must have been a mere excuse).—Dr. G.—C. B. V.—G. B. M.—W. W. L.—Dr. T.—F. M.—T. P. W.—R. J.—C. & Co.—T. M.—River Commission.—C. & Sons.—H. P. H.—W. R. W.—J. B. C.—S.—G. M.—A. Z.—E. I.—J. H.—A. H.—Mr. G.—C. C. H.—J. C.—F. M.—J. B.—S. & J.—A. H.—A. T.—T. P.—Messrs. H.—N. & C.—G. P. M.—W. & H.—A. G.—R. D.—W. E.—T. H. A.—T.—J. W. T.—G. G.

We are compelled to decline pointing out books and giving addresses.

All statements of facts, lists of Tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

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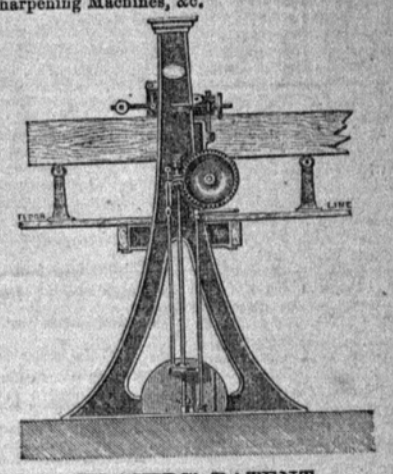

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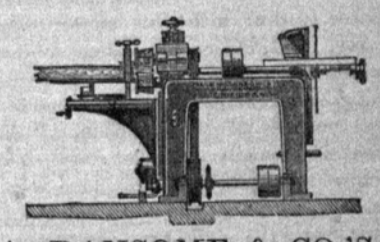

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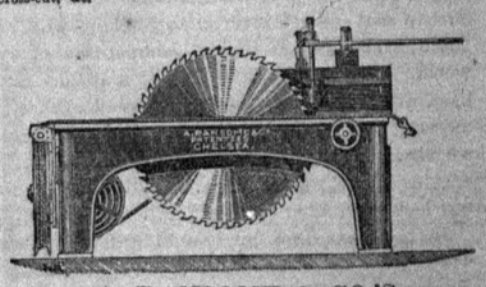

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VOL. XXVIII.—No. 1413.

The Education of England.

THE earnestness with which the Right. Hon. W. E. Forster addressed himself to the great question of elementary education, in introducing the Government measure, seemed to sway the sympathy of the House of Commons by its rugged force, and to raise the tone of the debate, in at least the greater number of the speakers, far above the miserable bounds of party. The subject is one too intimately connected with the labours of the *Builder*, for a quarter of a century, to allow us to pass it over in silence. Our readers may naturally expect us to give, in a somewhat concise form, an explanation of the mode in which the Government proposes to deal with this master-question of the day. But, before descending to detail and to objection, we cannot omit the occasion of echoing, with emphatic assent, some of the casual remarks of the president of the Committee of Council. The language, indeed, to which we refer, might almost have been copied from our own columns. "*We cannot afford to wait*," said the right hon. gentleman. Upon the speedy provision of elementary education depends our industrial prosperity. It is of no use giving technical instruction to our artisans without elementary education; and many of our labourers are highly uneducated, and for the most part unskilled. If we leave them any longer unskilled, notwithstanding their strong sinews and determined energy, they will become over-matched in the competition of the world. The communities throughout the civilised world are gathering themselves together in masses; and we know that in our small island we shall no longer hold our position among the nations of the world, if we do not make up for our lack of numbers by our intellectual force.

In the year 1869 an annual grant of about 415,000*l.* was required for primary schools in England and Wales, of which 11,000 were day schools and 2,000 were night schools. About 1,450,000 children were upon the registers; and the average attendance was about 1,000,000. Not more, however, than two-fifths of the children of the working classes between the ages of six and ten, and not more than one-third of those between the ages of ten and twelve, are on the registers; so that out of 1,700,000 children of the earlier age 1,000,000 are untaught; and out of 750,000 children of the later age 500,000 are untaught. The million of children attending the schools thus form the minority; outnumbered in such formidable proportions by those who are left to a self-acting preparation for the workhouse and the gaol.

To the 415,000*l.* provided by Parliament, the parents of the children educated last year added the sum of 420,000*l.* paid by them in school fees. The sum of 835,000*l.* was thus expended on the education of between a million and a million and a half of children, or somewhere about the old English mark per head. Considering the low educational state of the country, it must be held satisfactory to learn that, in providing for the elementary education of the very poorest, the efforts of the parents have met those of the Government half-way. The indication thus afforded of the mode in which more comprehensive and vigorous efforts on the part of the educating class will be met by those whose children we seek to educate, is cheering. One-third of the cost of education from the Imperial revenue, one-third from the local rates, and one-third from the parents, is the proportion in which it is proposed that the funds required for the establishment of a comprehensive system of primary education shall be raised for the future.

In establishing this general principle, however, the Minister has not lost sight of the fact that certain modifications of detail may prove expedient. In the great centres of population, which are so often centres of educational destitution, powers will be taken for establishing free schools in case of proved necessity. And for parents who are *bonâ fide* unable to contribute to the education of their children, provision will be made for the issue of free tickets. With a sense of respect for the dignity of human nature, alike in rich and in poor, it was added that care should be taken that such free tickets should have no special stigma of pauperism attached to them. We wish we could believe that this system would provide what we insist on, the education of every child; but we cannot, and we look with anxiety to the result of efforts that will be made to modify this part of the Bill.

The Minister is not blind to the crying necessity that exists for revising the entire system of local rates. This question, however, is one demanding time for consideration and for discussion; and no reasonable man can wish to keep the children throughout all England untaught until it is solved. Thus the charge upon the rates may be considered as a temporary part of the measure, subject to revision on the occasion of any general review of the subject of local taxation. In the mean time it is not proposed by the Bill to pass any special education rate, but merely to institute a charge on the poor-rate. In the case, which is not considered probable, of this charge exceeding 3d. in the pound, there is a clause in the Bill which stipulates that there shall be a considerable extra grant out of the Parliamentary votes.

Having thus cleared the ground, by explaining the actual state of the primary education of the country, as far as the expense incurred is concerned, and the mode in which it is proposed to supplement the payment of school fees by the parents, we come to the principles of the Government measure. These are two. The first, to which it is proposed to give the force of legal enactment, is, that there shall be efficient schools everywhere throughout the kingdom. The second, if properly stated, is, that no child shall be suffered to grow up in a state of total educational destitution. This broad and wholesome principle, however, is not yet distinctly stated, or provided for. It underlies the idea of the measure; but, from the anxiety which has been felt by the framers of the Bill to secure as wide an acceptance of its provisions as possible, it is rather inferred than enounced. Thus what Mr. Forster spoke of as the second principle is virtually only a corollary of the first; namely, that there shall be a compulsory provision of these schools wherever they may be proved to be wanting, and only where this want may be proved. The measure, however, should go farther. Regarded as a matter of principle, no maxim can be considered satisfactory short of this: "A SCHOOL FOR EVERY CHILD, AND EVERY CHILD TO GO TO SCHOOL."

In proceeding to the provisions of the Bill, we are reminded *in limine* of the manner in which the science and practice of the engineer form a basis for all sound legislation. The graphic representation of facts becomes daily more habitual and more important. Thus the first requisite for a School Bill is a school map. The country has to be properly mapped and divided, as a preliminary to any organisation of education; so that there shall be no spot in England or Wales that does not fall within a definite scholastic division. The limits which have been adopted for this purpose are those of existing boundaries. As regards the country proper, the "civil parish" is adopted as a school district. In towns, the borough boundary is taken as that of the educational division. In the metropolis, the districts of the workhouse schools, where such exist, are taken, and, in their absence, the boundaries of the vestries. Classes are introduced to allow of the grouping together of smaller districts, under the name of "United Parishes" or of "Contributing Parishes," but it is not proposed to take the "union" formed for the purposes of the Poor Law as the educational unit.

The outline of the educational survey of the country being thus arranged upon the map, the next step is to investigate the state of educational destitution by actual inspection. For this purpose powers are taken to call for returns showing the number of schools, of scholars, and of children in each educational district. Inspectors are also to be sent down; and any district in which it is found that the existing elementary education is at once sufficient, efficient, and suitable, will be let alone. By sufficient it is intended to express the fact that there are enough schools; by efficient, that these schools give a reasonable amount of secular education; and by suitable, that there shall be no religious or other restrictions to which parents can reasonably object.

Each school district is to elect a "school board." In the metropolitan districts such boards already exist, having been elected by the different boards of guardians within the unions. These boards will remain. In the towns, the town council is to form the electoral body; in the country, the select vestry, when there is one, and the ordinary vestry in other cases. Any person is eligible as a member of a school board; and the number constituting each board is not to be less than three, or more than twelve.

On these school boards is devolved, in the first instance, the duty of providing for the education of their respective districts. How far the information which the Government take power to collect is to be placed at the disposal of these boards, what steps are to be taken for securing the adoption of a general standard of sufficiency and of efficiency, and what is to be the normal central control exercised over these boards, does not appear.

The school boards are to have the power of borrowing money on the security of the rates, to be repaid in thirty years. They are to have the power of assisting existing schools, of providing new schools, or of doing both. But they are *not* to be allowed to assist certain schools, and to refuse assistance to others, on denominational grounds. The mode in which failure of the school boards satisfactorily to perform their functions is to be remedied was not stated by Mr. Forster.

The main regulations under which public elementary schools are to be conducted are these:—The first already exists, being to the effect that the school shall be kept up to that standard of secular efficiency which Parliament may from time to time determine. The second is, that they shall admit any inspector without any denominational provision. The third is

that no religious education shall be compulsory upon any scholar. If we rightly understand the provision, it is to the effect that the teachers of any school shall be at liberty to impart religious instruction to the scholars according to their own denominational or doctrinal views, subject to the permission of the district school board; but that any parent shall be at liberty to withdraw his child from being present at such religious instruction. The subject is one involving extreme difference of opinion, though our own opinion is quite clear on the matter, and the object of the framers of the measure appears to be, to remit its decision, in each instance, to the verdict of local public opinion, as delivered by the majority of the school board, or to limit the scene of the denominational contest to that arena. Such a mode of turning, rather than of vanquishing, the difficulty, is not what we can advocate.

Thus far we have considered the provisions which are designed to carry out the first principle enounced for the new measure, namely, that there shall be efficient schools everywhere throughout the kingdom. Such might be the result of the enactment *if* the new boards of education were likely to rise to the full height of their important duties; but this is not to be expected. As to the second portion, Mr. Forster's speech confirms the remark which we previously made on the second principle adopted by the Government. "The country expects us," said the right hon. gentleman, "to secure the attendance of the children. After much consideration the Government have allowed the question of direct compulsion to be brought before the House." The statement was received with cheers. The principle, it was argued, had already been admitted by the Legislature, in prohibiting the unrestrained labour of children.

Different measures are proposed in order to obviate, except in the last resort, the need of recourse to direct compulsion applied to parents. The first of these is an extension of the powers of the Act that bears the name of the present Speaker of the House of Commons; so that, instead of a Board of Guardians having the power of sending children receiving relief to school, their being sent to school might be made a condition. Then the short-time system might be extended to all trades, and also to agriculture. Thirdly, is given a plan for giving a certificate of education, and making it easier for children holding such a certificate to obtain employment than for others to do so. Then the industrial school system might be followed, involving the compulsory attendance of children under a certain age. The concurrent effect of these several methods may be looked forward to. The details of the Amendments of the Speaker's Act are remitted to the responsibility of the Poor-law Board, and those of the Acts relating to the short-time system to the Home Office. But it is evident that all these indirect methods of stimulating education fall short of the legislative declaration of the principle that it is the duty of every parent to send his child to school.

In the last resort, therefore, it is proposed to give power to the School Boards to form by-laws for the compulsory attendance at school of all children in their district from five to twelve years of age, inflicting penalties on those parents who fail to send their children to an elementary school without a sufficient excuse, such as the receipt of education elsewhere, sickness, or distance of residence from an elementary school exceeding a mile. The by-laws are to receive the sanction of the Government, and to remain for forty days on the table of the House, without receiving dissent, prior to being carried into operation. Power is also to be given to the School Boards to establish industrial schools. The small endowments which were not touched by the Endowed Schools Bill of last year are made over to the new governing bodies. Further power is given them to suggest amendments, which may come into operation if approved by the Government. Such are the main provisions of the Bill.

It is not our purpose to enter into any detailed criticism now with reference to this important measure. Of the two main principles of the Bill, the first is accepted by every educated Englishman. The second is hourly securing an increasing number of adherents, amongst whom the classes that form the main object of the solicitude of those who legislate on the subject are by no means the least numerous or the least hearty. The graphic delineation of the educational state of England—the map of the great moral disease of dark and depressing ignorance—the life and death map of national promise—is a step of obvious necessity. Still the merit of having distinctly recognised that necessity is not small. The collection of reports, the mission of inspectors, and the removal of any denominational character from the visits of these inspectors, are all coherent parts of one general plan.

The remaining provisions of the Bill hang together on the cardinal assumption of another principle, as to the wisdom of trusting to which there will rightly arise a great conflict of opinion. Down to this step all has depended on the responsibility of the executive, under the ordinary Parliamentary check. For the remaining provisions the responsibility of the executive is reduced to a minimum. The Government is only to be called upon to give a sort of negative sanction. The initiative is entirely thrown upon the local bodies,—the vestries, the town councils, the various forms in which municipal organisation exists, so far as it does exist, among us. Not only the aid of schools, the erection of schools, the choice of teachers, the general disposition of the elementary education of the country, are made over to the new Educational Board; but the altogether unprecedented duty of originating penal bye-legislation, subject alone to executive and Parliamentary interference, is thrown upon those untried bodies. It would seem to be thus rendered impossible that the educational tone of any district should rise above that of the men whom the popular voice of that district called to take seats at the education board, or that the higher educational level of one portion of this country should exert any direct influence on the lower and less enlightened state of the darker districts. No provision seems as yet to be made for sending the fully oxygenated life-blood of national culture direct from the heart. Something more is absolutely required.

This devolution of the functions of that great officer, of whom the appointment has been often so strongly urged,—a Minister of Education,—on local, popularly chosen boards, is the more remarkable from the fact that the mover of the Bill expresses the most unequivocal condemnation of our existing municipal organisation. "We are behind almost every other civilised country," said Mr. Forster, "whether in America or on the continent of Europe, in respect to municipal organisation."

On this point the Minister admitted the existence of great difference of opinion. He argued that if use is to be made of municipal bodies at all, the wisest course is to treat them with fairness and confidence. He judges from the past that these bodies have risen to the height of the duties they had to perform. He referred to cases in which a rural vestry or a town council had been a scene of squabbles until it had important duties intrusted to it, and then it had risen to the level of those duties, the members exhibiting qualities which they were not known before to possess.

It is important that every one who has a voice in the matter should distinctly grasp the idea of the two-fold principle which we have endeavoured thus to trace to its source, and to follow out in its operation. But whether the Bill becomes law in its present form (which we should regret), or under any modification, whether the first result exceed our hopes, or call us, by the kindly teaching of disappointment, to fresh effort, Mr. Forster has entitled himself to recognition such as the memorable resolution of the Roman Senate awarded to the Consul Marcus Terentius Varro, when he took refuge in Canusium after the loss of the Battle of Cannæ. He has not feared to engage the enemy, and he has not despaired of the welfare of the State. Let him now go a little farther.

We must be pardoned for adding one word as to the education map. We trust that it will be something more than a mere index of districts and of schools. The skill of the engineer in the graphic representation of statistical facts can be nowhere more appropriately called into play. It is possible so to construct an education map as to make it indicate, at a glance, the population of the district, the number of children, the number of schools, the number of attendances, the amount of independent local support, and other important details.

Such a map, if annually re-edited, would give a view of the educational progress of the nation that would speak for itself, and would save the perusal of a whole volume of returns. If so constructed as to be readily compared with other graphical charts,—such as the geological map; maps indicating the cultivation and product of the soil, and its mineral products; maps indicating population and industry; maps indicating land and water communication, water supply, and sewage; maps indicating health and disease;—it will form a part of a statisto-graphical atlas that will not only prove of the highest utility to the Administration of the day, but also form a precious contribution towards the history of civilisation.

NEWHAVEN AND ITS POSSIBILITIES.

NEWHAVEN progresses but slowly, very slowly indeed. As a town upon the map, or as a sound in the ear of a railway traveller, sight-seer, or commercial man, it would betoken to the would-be-visitor a spot worth seeing and knowing; but look at it even without exploring it, and the illusion will be at once dispelled. Situated at the mouth of its harbour on the oozy Ouse, and inwardly flanked on each side with its bleak and undulating hills, and bulwarked seaward with its projecting chalk cliffs, it would at once strike a strategetic mind that it offered great natural facilities for a coast defence against a foreign invader. Yet century after century has been let pass, and the Government of this country seemed to be oblivious to the fact. An invading army could swoop down on the coast of Sussex here, sack, pillage, and burn all before it with rapine and spoliation in its rear, not ceasing in its onward march till it swept the chief town on each side onward through Lewes to Royal Brighton.

For the last five or six years, however, the attention of the authorities has been given to the construction of a fort at the mouth of the Ouse, and the upshot is that a very extensive basis of fortification is in course of completion. On Castle Hill, or the West Cliff, as we shall call it, this fort raises its crest some hundreds of feet above the sea-line, presenting seaward a chalk cliff, but within partly built up, and shaped to its required uses with excavated material. A very deep and wide moat surrounds the fort, running at right angles, the side walls of which are of solid concrete-battering some feet in their height. The seaward passage of the moat inclines in its base-line upwards several feet, the harbour avenue downwards to the river. The fort thus forms a bold and elevated intrenchment on the angle of the western cliff, commanding both the offing and the entrance to the harbour mouth. An arched entrance leads into the fort from the inland side, access to which will be by a drawbridge spanning the inner moat, or fosse. The landslip which took place recently of the earthworks here tore down like a little avalanche, and swept a portion of its retaining wall into the moat. The seawall of the fort will be guarded by several heavy pieces of ordnance, or, in other words, a battery of many guns, of very large calibre, which, when mounted on their carriages, will sweep a circle on their respective tables to any given point on the coast. A four-gun battery of ordnance, of about five tons in weight, or 68-pounder, will command the harbour. In the centre of the fort is situated the soldiers' and officers' quarters, magazine, gunners' rooms, stores, with the underground passages ramifying therefrom right and left. An inspection of the works convinces us that it is very well designed as a work of coast defence, and the inner buildings are well and solidly built. Some of the outer breastworks or embankments—that portion which faces the harbour, and inland—are very faulty. Greater care will have to be taken than has already been bestowed in the completion of the external finish, on the score of security, or landslips will be afterwards inevitable. Already in two or three places we have noticed very serious landslips of the embanked earthwork, which no doubt were partly owing to the prevalence of stiff gales and heavy soaking rain. Some of these slips have, notwithstanding the great incline of the embanked work, torn away, sweeping their retaining walls and all else before them. Earthworks or embankments, no matter how much they may slope, or no matter how thick may be their retaining walls, require in a lasting work of fortification a binding or tie, which may be produced by an intersection of masonry in given places through the earthworks.

In noticing these landslips, an observer who was standing by remarked to us, that during the construction of the works they had already taken place three times, and the most noted of them precisely in the one spot. Here was a lesson for future guidance, which even at this moment does not seem to be improved upon. Where the body

of the earth has been displaced, a chalk shingle has been introduced, in hope that future mishaps may be prevented. We shall not anticipate with what result, standing as it will alone.

In one of the passages belonging to the barrack a very deep well is constructed, capable, we are informed, of supplying 95,000 gallons. The water is pure; and this reservoir is formed also to catch the clear soil and cliff drainage underneath and without the vicinity and circuit of the fortifications.

When finished, the fort is intended for the permanent location of about 200 men. At present there are only about half a dozen of artillerymen stationed there. The works will be hardly completed within two or three years. Mr. Kirk is the contractor, and there are about 150 men, including mechanics and labourers, employed.

Having said so much about defences, we may well begin with the offences. Well, Newhaven has hardly taken off her nightcap yet; and notwithstanding that it is a packet station *vid* Dieppe, she has not awoke to the important position she might occupy in the van of progress. At present she is a very laggard. True, the railway kisses the skirts of the town, and pours out a living nocturnal freight on her wharf; but, alas! they are only birds of passage that alight but for a moment, to again wing their flight across the Continent. Newhaven and its modest hotels, spasmodic inns, and dreary shops, are no better off in consequence. The Railway Hotel at the harbour crimps the money folk *en route*, and what is spent is spent while the boats are waited for. The town hotels and inns are mostly depending on the country and farming classes. Talking of hotels, Newhaven town contains but two bearing any approach to the appellation we give them. One is called the "Bridge Hotel," the other the "Commercial Hotel." The former lives on the still refulgent glory of posthumous patronage. It has a Royal memory. It had the honour of giving shelter, bed, and board to a fugitive king in 1848. Poor Louis Philippe, after his unfortunate flight, rested there; and perchance as we write we are sitting at the identical round table, and when we retire perhaps the worthy landlord deigns to accommodate us with the same cosy bed on which the dethroned monarch lay. See what it is to follow in the footsteps of the great, even in the far distance. The worthy landlord does not forget to inform the public of the honour that is his. Outside, on the front of the hotel, the painter has told in conspicuous letters that this hotel was patronised by Louis Philippe in the year 1848.

The streets of Newhaven, if we can call them streets, are small in number, and with the exception of one or two,—High-street, for instance,—might more appropriately be called roads or lanes. There is hardly the indication of a pathway, properly speaking, in any of them. The streets, and where the pathway should be, are one natural level. The rain, when it falls, runs down what channel it lists. The major portion of the town has been built on an incline. The drainage makes quick "tracks" down the nearest sinks, and finally kisses the muddy Ouse. In the town proper the population is but small, scarcely over 2,000, and the idea of a local Board for Newhaven is at present but a dream. When the town aspires to that position, her sanitary reformers will find no difficulty in perfecting a proper system of drainage and sewerage.

Formerly the river Ouse made a sort of horse-shoe circuit some distance above the town, passing into the harbour again in a straight line opposite the town. A useful bit of engineering, however, was accomplished two or three years since,—this ugly bend of the river was cut through, and the river made to continue a straight course. This improvement necessitated a new bridge, as it completely severed all connexion with both sides of the river. The old bridge, of course, crossing the bend, was left almost isolated in consequence. The circular part of the river now forms a sort of back-water, with two mouths, entering into the main channel. This portion is still in use as a sort of inner harbour, and the old wooden draw or lift bridge has but little service to do save to let an occasional small craft pass round to the back of the town. On this now almost neglected estuary of the Ouse shipbuilding once flourished for a short while; but all is now gone, and nothing but a dismantled shipbuilding shed, and shattered slips, sunken piles, desolation, and doom is now apparent.

The new iron bridge is one on the revolving telescope principle. It presents a good roadway, but as a construction it is not over-strong. It is opened occasionally to let small vessels pass. It is, however, not troubled with much dead weight in the form of merchandise, as the railway relieves it of the trade and manufacture outward and inward bound.

On an elevated hill overlooking the town is the old parish church dedicated to St. Michael. Its tower and chancel are very ancient, but the body of the church is a restoration of some sixteen years since. The coping stones of the tower, over which a low shingled roof springs, are supported by a series of corbel images reaching all round. Several of them are very fantastic and *outré*, and the majority are much defaced by time. Two or three small double-arched windows perforate the tower. One of them is in a tolerable state of preservation—column and capital. The nave, north and south aisles, are of flint, with small windows in the Pointed style, with Caen stone dressings. The restoration is durably built, but it is destitute of ornament or beauty.

The old churchyard is carpeted over with a perfect mossy sward, and is in good order. It contains a few old monuments of interest, and in a churchyard of its size we never remember to have seen so many poetical epitaphs. Every third or fourth slab one meets with rhyme if not reason. Out of the number we were tempted to transcribe one, which we give as the best specimen we came across. It occurs on the monument of one Thomas Tipper, a brewer of local celebrity, who manufactured a famous Newhaven ale still called after him. The epitaph runs:—

"To the memory of Thomas Tipper, who departed this life May y^e^ 14th, 1785, aged 54 years.

Reader, with kind regards this grave survey,
Nor heedless pass where Tipper's ashes lay:
Honest he was, ingenuous, blunt, and kind,
And dared to do, what few dared, speak his mind.
Philosophy and History well he knew,
Was versed in Physic and Surgery too;
The best old Stingo he both brewed and sold,
Nor did one knavish act to get his gold.
He played through life a varied comic part,
And knew immortal Hudibras by heart:
Reader, in real truth, such was the man,
Be better, wiser, laugh more if you can."

Reader, so runs the immortal Tipper's epitaph' we fear there are very few even London brewers of the present day could lay claim to all the varied talents of the Newhaven brewer of old. There is a tombstone here also to the memory of a young Irish surgeon, of H.M.S. *Hyperion*, who died at an early age in 1830, much regretted by his messmates. He was a native of Newtown Mount Stewart, in the county of Down, and of the name of George Rogers. This slight notice of his grave on the wild coast of Sussex may awaken a memory of him in his native land. The most conspicuous monument in the churchyard is an obelisk erected to the memory of Captain Hanson and 104 officers and men of the *Brazen*, sloop of war, lost on Newhaven coast in January, 1800.

On the west of the harbour, on an elevation, a coast-guard station has been recently erected, of brick construction.

Before taking leave of our subject, we shall direct attention to the great natural facilities that exist for making Newhaven an important and progressive seaport. We have said at the beginning that the town was progressing but slowly. In saying this we spoke nothing but the truth. The small coasting inward trade of Newhaven consists at present of a little coal and corn. Some of this passes upward on the Ouse to Lewes in barges. The outward trade consists of flints for the Staffordshire Potteries, and some timber for ship-building. The goods traffic *vid* Newhaven and Dieppe is, at times, considerable.

The harbour of Newhaven would be much frequented as a harbour of refuge if it were deepened and widened. The present entrance is under 200 ft. wide, and possibly at highest tide the depth of water does not exceed 22 ft. At an ordinary tide, it runs about 16 ft. or 17 ft. At low water, the steamers and other craft are lying some feet deep in mud, and the depth of water in the centre of the channel there averages about 6 ft. This is a bad state of improved harbour management for a shipping port.

One or two dredging steamers are wanted for Newhaven harbour, and there is sufficient to do all the year round for the larger number. One might be employed always in the harbour, the other outside deepening the approaches. A considerable distance must be gone out before 7 fathoms of water are obtainable. In a short period and with no great amount of labour, men-of-war of large dimensions could ride in near the harbour. This would be a great advantage taken in connexion with the new fortifications. Between Newhaven Cliff and Seaford Cliff the beach is low, and the sea-line sweeps a circuit inland. This area could be utilised by the construction of breakwaters and deepening for an outer harbour, where a whole fleet might ride in security and safety. On Seaford Cliff a battery will also be required as well as at Newhaven. The present fort and martello tower would not tell for much in case of invasion.

A fine opportunity exists at this moment for utilising the sewage of the Ouse, and Newhaven offers every facility as to place, position, and the proper carrying out of a native guano company.

On that spot of ground which has become an island by straightening the river, the necessary works could be erected. Surrounded as it is on all sides by the river, loading and unloading barges could form a cordon round the island; and the River Ouse, which is navigable for boats as far as the prosperous town of Lewes, would be the means of transit for the supply of the sewage to farmers.

A careful consideration of the subject, and personal observation of the ways and means, convince us that we are risking no idle opinion. There are thousands on thousands of tons of sewage—rich mud—easily convertible into admirable manure, lying waste on the bottom of the River Ouse and in Newhaven harbour; and thousands of acres between Lewes and Newhaven are semi-sterile for want of manure.

We have pointed out a neglected resource in Sussex, and we trust that it will not be long until we hear of its development.

If a few men of capital and spirit would establish native guano works at Newhaven, they would soon conquer prejudice, and they would shortly find that the investment of their capital would yield a remunerative return.

Shipbuilding is a trade that could be easily revived in Newhaven, and could be carried on with advantage to the port and to the promoters. If the bend of the River Ouse were again resorted to for shipbuilding, dock gates would be necessary at both entrances to the main river.

We hope that whenever we retrace our steps towards Newhaven we shall find it more prosperous than it is at the commencement of this year, 1870, and that the few hints we have thrown out will not have been thrown away. Certain we are that Newhaven possesses great advantages, and that it only requires a little public spirit and some outlay to give the town a position commensurate with its port, and to make both port and town worthy of each other as places of commercial enterprise and national importance.

Another neglected resource which offers good facilities for its development in connexion with Newhaven, is the fisheries. A colony of fishermen could, with little expense, be located here, and with proper boats and gear, no danger would exist of not having a good market. With through communication to the London markets daily, any quantity of fish could be despatched and disposed of. Brighton and Lewes alone of the Sussex towns, in the visiting season, would consume large quantities. Newhaven, however, has always been wilfully neglected, harbour and town. From the year 1731, when an Act was passed for repairing the harbour, to about a decade ago, little or nothing was done. Upwards of a century and a quarter ago the same complaint existed; the piers were decayed, and the mouth of the Ouse was choked up with mud and sand, so much so that vessels over sixty tons would not venture into the harbour. A small ship-building trade was carried on in Newhaven even in the middle of the last century; but, as we have already remarked, this is now extinct.

Employment of Soldiers in Trades.—In the Commons last week, Mr. Hanbury-Tracy asked whether it was the intention of the Government to promulgate regulations for the employment of soldiers in the trades which are connected with the supply of their clothing and subsistence, the stores required for their use, and the repair and construction of their dwellings. Mr. Cardwell said it had been decided to organise in each regiment a corps of artisans, and tools had been issued with that view to twenty-six regiments. A military committee had been appointed to consider the details of the arrangement.

ARCHITECTURAL OUTLINE.

THOSE who are accustomed to observe, or, better still, to study and sketch, the many varieties of natural scenery, know well how much of the character and expression of a landscape depend on the mere forms of the lines bounding its several gradations in foreground, middle, and extreme distance.

This applies not only to the broad distinctions of mountainous, undulating, or flat landscape, but in each and all such to their various parts; as, whether the transitions of form be abrupt or gradual, few or many within the ordinary angular scope of a picture. A mountainous landscape may fail of grandeur through roundness or monotony of form in its lofty features, and a flat scene may be redeemed from tameness by the boldness, variety, or piquancy of the vertical objects, natural or artificial, which break its line against the sky.

Any one who is familiar with landscapes of the Flemish school of painters will easily recall instances in which Jacques and Solomon Ruysdael, Abram Storck, Francis Decker, and others have proved on their canvas the capability of interest, from happy treatment in this respect, possessed by scenes on river, dyke, or plain, which might seem to an ordinary spectator incapable of picturesque effect.

In many of the paintings of these artists the relief from the monotony of a dead flat horizon is produced almost entirely by the projection against the sky of the very distant towers and gables of some city or seaport, in which, however, the distinctive characters of the buildings, in spite of their minuteness through distance, are wonderfully preserved, and when, as is sometimes the case, a town occupies the middle or near distance, this truth of character is still more marked.

The same observation holds good with regard to the pictures of Canaletto, and to those who have not visited Venice the modern art of photography confirms the perfect truth with which he caught and rendered the varied features of the city which he helped to make famous. Among the artists of our own school of the last and present centuries some deserve the same meed of praise for truth and precision in delineating architectural character. Francis Nicholson and Girtin among the early water-colourists, and David Roberts in the school of oil painters, specially claim this merit. F. Mackenzie, Gandy, and others, professedly architectural artists, scarcely come under the same category, as truthful delineation is the specialty of their line of art.

The great part in the expression of a picture, comprising buildings among its elements, which is dependent on the forms of these where they are included in the bounding lines of the composition, is as certainly and evidently true as is what has been said above as to natural objects, and it is much to be regretted that among the many delineators of topographical scenery this fact is so frequently lost sight of; detracting from the interest and value of otherwise often beautiful pictures, in which the artist has seemed content merely to catalogue, as it were, the features of a town or vicinage, losing sight of distinctive character, and thus sacrificing essential reality and truth. Some will argue that this precision is of no importance, and that to demand attention to it is to bring down fine art to the level of mere realistic representation; but this we hold to be a great mistake, for while deprecating as earnestly as any artist can the petty attention to mere detail, which destroys breadth in seeking reality (which it *does not* secure), still we hold that *essential* character, that which in buildings, in natural objects, as in man, gives individuality, is called for in every representation claiming interest from local associations.

Take, as no exaggerated example, the view of such a city as Oxford, and suppose the Radcliff cupola, St. Mary's spire, and Magdalen tower all represented in due position by an artist, but of proportions evidently varying from what are really theirs, would a view comprising these objects, thus rendered, convey the impression of the scene, to one unacquainted with the place, or recal the feelings excited by it to one who knew and was attached to it? The true province of landscape art, in all its varieties, is to convey to a spectator, in the fullest extent, the best impressions which the real scene would excite under the particular aspect or effect chosen; and to produce this, characteristic delineation of all prominent features, whether natural or artificial, is essential.

It sometimes happens, alas! that some of the leading features of an otherwise interesting scene are discordant with, and detractive from, its charms, and the artist would fain find means to omit them from his picture, or to screen their deformity from sight.

Such, for instance, are the cemetery obelisk, and gasworks chimney towards the east end of Edinburgh; the latter, indeed, forming a fatal blot in all views of the town within its range, and demonstrating the destructive power in architectural scenery of a single prominent object out of harmony and scale with its general features and character.

Such being the fact, of how great importance is it that the artists intrusted with the design of buildings, of a scale or kind occasioning their forms to enter into the sky-line of town or village scenery, should bestow upon them the utmost study to secure a character in harmony both with their own purposes and with the surrounding objects? and how much is it to be deplored that a false ambition should often lead to the production of something either fashionably trite, or novel and "striking" (mis-used phrase!), rather than fitting or congruous in such cases?

This appears to us to have become in some respects unhappily common in the present day; and as regards the first-named error, the towers of some of the lately built and more lately projected townhalls may be cited; and as to the latter, but too many of the steeples of recently designed churches.

That a type of form diverse from the ecclesiastical should be employed for municipal buildings is doubtless proper and rational; but that so many should be crowned with square towers, hip-roofed, and terminating in a flimsy timber spirelet, seems neither one nor the other; nor could any better reason be perhaps truly assigned for this than that the example has been set by one or two men of large and successful practice, and that most of these buildings being the subjects of competition, the public fancy required tickling with what its palate had learned, however uncritically, to relish and desire.

This form has in reality little force of effect, and is subject to one great source of weakness in the very small proportion which the spirelet, generally octagonal on plan, bears to the breadth of the tower when seen on the diagonal.

Not invidiously to name examples, it may be enough to say that some of our leading towns have of late years acquired additions to their architectural outline of this kind, which can never be regarded with satisfaction by unbiassed critics, while an additional regret is excited that occasions have thus been missed in which the liberality of outlay might have secured, with more independence of design, features conducing vastly more to local architectural effect.

Such examples, however, as the cupola of the Leeds Town-hall and the steeple of that at Halifax (and we may add that of the new municipal buildings in Liverpool resembling the latter) must be named as exceptions to this too general form, and such as by their vigour and decision of outline conduce much to the architectural sky-lines with which they combine.

There can be really no valid excuse for monotony of design in features of this kind, if only real artistic study be given to them. Why should it be less possible to vary the towers of secular than of ecclesiastical buildings? And if in examples of such fundamentally similar structures as the towers of York, Canterbury, Lincoln, Durham, and Gloucester cathedrals such marked individuality of character can exist, why should not more variety of design on generally resembling bases be aimed at and achieved in our municipal halls?

As regards ecclesiastical design, the error seems, as said above, to run rather in the desire after novelty (often really but imitation of some exotic phase or example) than in adherence to a type; and thus we have towers corbelled, machicolated, turreted, and saddle-backed; and spires pierced, shafted, coroneted, pinnacled, and buttressed, producing ponderousness in one case or fritter in another, where a studious endeavour after dignity and fitness in design might have secured much more of true originality at, probably, considerably less cost.

The scope for variety in the simple combinations of form required in steeples is scarcely less extended than exists in music for melody, and to cite examples all simple, all fine in themselves, but widely differing in treatment, it is not necessary to go beyond a few English parish churches, as Ewerby, Bloxham, Raunds, Heckington, Newark, and Stamford,—a list which might be vastly extended both in this simple class and those of greater scale and pretension.

It can hardly be that the oft-inculcated and most needful practice of *design in perspective* can have been resorted to in producing some of the rather ambitious, not to say ostentatious, steeple designs of the day; scarcely can it be that a diagonal elevation or section has been tried before settling their arrangements of form; or surely we should have been saved some examples of which only the direct square elevation is tolerable, while the diagonal view is weak, ill-graduated, and ungraceful, sadly contrasting with such designs as our old church builders have bequeathed to our admiration in the class of examples cited above. Recurring to the illustration with which we set out,—natural scenery is full of suggestions of design to the careful student, and in the upper bounding lines of elevated buildings no less than in those of mountain, crag, or cliff, may expressions of dignity, repose, vitality, and cheerfulness be produced without any sacrifice of structural or statical sufficiency; but only by the exercise of patient thought and careful study, proportioned to the importance of the subject under design, but all more than repaid by a result securing to some perhaps already noted point of scenic effect a new feature of recognised harmony and symmetry, enhancing without disturbing the prevailing architectural character, and such as would be felt as wanting to its completeness, could it be withdrawn after once allowing its influence to be appreciated.

THE LIMITATION OF LOSSES BY FIRE.

SINCE public attention has been directed towards an investigation of this subject through our columns, we have been favoured with various communications and statements having reference to certain issues involved. Amidst the numerous comments which have appeared in connexion with late disasters, including the destruction of the Star and Garter Hotel, and the truly piteous loss of the manager's life, we fail to note any attempt being put forward with a view of effectually lessening the general risk in similar cases which may be expected at any moment to arise.

To put into a practical form the views to which we have already given expression, as to a more efficient system of fire protection, we find ourselves again constrained to call into prominent notice the important, if not decisive, relation which the insurance system holds in this direction.

In the present juncture it may recommend itself, as a matter of good policy, even in connexion with the interests of those important associations, should they be induced to share our views.

The extensive losses to which the various insurance offices are so eminently exposed, by reason of their dependence upon the system of protection afforded by the metropolitan fire organisation, might well invite criticism. No less than 30,000*l.*, it is stated, will have to be contributed by the insurance companies to make good the loss sustained in the destruction of the Star and Garter Hotel; and it cannot fail to occur to many that by an expenditure, with a view to protection, rather than restoration, of probably one-twentieth of that sum, advantageous results might have been fairly expected to have followed. It is at this point in our apprehension that the insurance system apparently fails to satisfactorily meet the demands of the community, and the unaccountable oblivion displayed in covering the risk of the insurance of the Star and Garter may challenge unjustifiable comments. There was scarcely any water in the tank, and what there was could scarcely be said to have been in any way available. There was not a really practicable fire-engine in the town. There was no fire-escape. It might have concerned even the interests of life insurance companies to have interfered. But there was scarcely anything to be detected beyond the mere acceptance of the premium, and of the risk. To point out to the insurance companies the prospective means of increased gains, although it may necessarily follow from the adoption of the course which we seek to suggest, is not our more immediate object. The long succession of destructive and fatal fires now in course of being recorded in the daily press, peremptorily appeals to the common sense of the public. Our hopes of some practical remedy being at length

discovered for, at least, mitigating the usual incidents by which many of these occurrences are attended, receive some confirmation from the circumstance that the matter is now likely to recommend itself to the consideration of the insurance companies. Considering that a sum of more than one million sterling is annually returned to insurers by way of making good the annual average loss of destroyed property, it might, even upon the score of expediency, be asked why some adequate proportion of this sum should not be expended to prevent such disasters as those to which we allude altogether, as well as with a view of limiting the amount to be returned to the public on account of life and property destroyed by fire. Supposing, even, that the entire sum of one million were expended in the direction which we have indicated, the insurance companies, we find, would still in their new relation to the public stand to realise a net yearly gain of five millions; for which they would in all probability, and having reference to their own statements, be called upon to render no service or return to the public whatever.

It is obviously within the capacity, and to some it might appear within the good sense, too, of the insurance interests to take this matter in hand in a broad and liberal spirit, and to seek to arrive by actual experiment at the comparative reduction of their remissions to the public which would result by placing at the command of the Metropolitan Fire Brigade, or of some similarly constituted body, an annual sum representing one-fourth of their usual restoration returns, or, say, an amount equal to 2½ per cent. of their net gains.

In whatever form this question may be now treated by the fire insurance offices, the public have been gradually led up to a position from which it may reflect upon the curious fact that, after contributing regularly every year a sum of nearly six millions sterling to the Insurance Companies with the view of realising preservation from losses by fire, the results as to the salvage of the property are most puerile and impotent, while with reference to human life they may challenge the imputation of deliberate if not criminal indifference.

It is found that by allowing things to take their course, and in abstaining altogether from devising a more effectual means of suppressing or preventing fires, a balance of nearly five millions remains to the insurance companies after the payment of all losses. It is singular that in recording, as the public journals have done lately, the loss of more than twenty lives, owing to the absence of any practical means of rescue from fire, and a large destruction of property, this, which we regard as one of the main elements of the subject, does not appear to have attracted observation.

It is now likely to do so; and inclined as we are as guardians of the public interest, and on the broader grounds of humanity, we would lend a ready co-operation to the insurance authorities to bring the disastrous element of fire under more effectual subjection. We believe that it may scarcely be disputed at the present crisis that in approaching this matter as we have done, we are acting in favour of existing assurance associations in saying that if some practical steps be not speedily resolved upon, the public may devise some wiser appropriation of the immense resources which are entrusted to the insurance authorities for this purpose, and in the application of which at the present moment such little cause for congratulation may be discovered.

ARCHITECTURAL DRAWINGS IN THE ROYAL SCOTTISH ACADEMY.

THE Royal Scottish Academy seems to have been affected by the example of the Metropolitan Academy, in turning a cold shoulder to the architectural profession; for we are given to understand that an unusual number of the drawings sent for exhibition have been returned this year. Be that as it may, the number of architectural designs exhibited is much below the average of former years. As a set-off to this, however, we may place the election of Mr. Dick Peddie, architect, as an academician,—an honour which he has fairly gained by the untiring energy he has displayed, and the careful manner in which he has endeavoured to impart an artistic feeling to the numerous important works entrusted to him. No. 214 is "A Suggestion for the Improvement of Edinburgh." The drawing represents a winter garden at the extreme west end of Princes-street Gardens, with the Ross Fountain, now being erected, in front of it. This garden has frequently before met with the special attention of Mr. Peddie, many of his suggestions being appropriate and suitable to the locality; but we have doubts whether the placing of a Crystal Palace under the shadow of the Castle Rock would be an improvement in an architectural or artistic point of view. Such an erection would doubtless be a great boon to the denizens of the New Town in weather such as this, when the cold biting winds from the Forth render it a hazardous proceeding to lounge in the usual promenades; but Mr. Peddie had better look out for another position for his winter garden, although such, we fear, may be difficult to find. No. 277, "The Intended Permanent Station and Hotel for the Caledonian Railway Company," would, on the other hand, be an undoubted improvement. The site is conspicuous and open, and the design elegant and appropriate; it bears some resemblance to the new stations recently erected in London, but is not an echo of any one of them. We trust we may, ere long, see it take the place of the present paltry wooden erection. As to No. 13, "St. Martin's Abbey, as proposed to be altered and enlarged," we are not acquainted with the mansion proposed to be operated upon, but presume that the architects (Messrs. Peddie & Kinnear) have followed up and improved upon the style of it, which, as shown in the drawing, is of the late French Château variety. The disposal of the parts is effective and lively, with a sufficiency of shadow and plenty of window-light.

No. 284, "Interior of the Church of St. John the Evangelist, Alloa," by Mr. Robert Anderson, is, in our opinion, the best ecclesiastical interior produced in Scotland for many years. It is a simple nave and chancel of thirteenth-century Gothic, unusually good in proportion and rhythmical in detail and polychromic decoration. Mr. Anderson also exhibits an exterior and interior of a proposed new church (353). It is a cross without aisles, and has a tower at the intersection, which is open to the interior. It does not show much power of invention, and is too like an old example.

No. 25, "Design for Presbyterian Church, Capitol Hill, Washington" (Mr. W. Nicholson, architect), is a commonplace affair, with pinnacles, &c., displaying neither originality nor a sufficient knowledge of Gothic detail.

No. 259, "Blair Athol, Perthshire, the Seat of his Grace the Duke of Athol," is an unaffected example of the Scottish Baronial style, by Mr. David Bryce, having nothing unusual or particularly calling for remark about it. A Gothic bridge, crossing a stream, in front of the main entrance, gives picturesqueness to the foreground.

No. 258, "Dumfries and Galloway Royal Infirmary," by Mr. John Starforth, is carried out in the pavilion manner, with some degree of architectural pretension: the sky-line is not satisfactory, but what there is of detail is not deserving of censure. No. 14, "Messrs. Kennington & Jenner's New Building, St. David-street, Edinburgh," is an *ad captandum vulgus* in compo, after the manner of the new Boulevards in Paris. In no city in the empire is the use of compo less necessary than in Edinburgh, where the finest building material is at command. Upon a conspicuous part of the building itself appears, in gilt letters, "G. Beattie & Son, architects," an inscription in as good taste as the edifice upon which it is inscribed. In No. 272, "View of the Staircase, Craigend Mansion," by Pilkington & Bell, we have a drawing showing that the interior of this mansion—which is Gothic in style, and occupies a commanding site within a few miles of the city,—is equally ornate with the exterior. If the *utile* is not sacrificed to the *dulce* (a fault of the architects), it is a most attractive and desirable residence. Messrs. Pilkington & Bell are not successful in their street buildings: the "Eastern Club, Dundee," is unhappy and overstrained both in composition and detail; the arched doorway and windows are stilted to a preposterous degree, and the disposition of the fenestration is destructive to unity of effect.

Mr. James Gowans gives another view of his buildings at Castle-terrace (No. 1); and Messrs. Cousin & Lessels a "Perspective View of Proposed new Buildings on the East Side of Blackfriars-street" (No. 143). It is really a relief to find that in some parts of the city domestic street architecture is meeting with some attention; for if we turn to the extensions to the west and south we find nothing but what is tame and commonplace appearing. The terraces and squares erected fifty years ago, under the superintendence of the late Mr. Playfair and Mr. Gillespie Graham, were remarkable in their day as architectural works; but now mere builders hold sway in this department, and when an architect is employed, he is restricted from giving any individuality or character to his elevations. Occasionally we find a new villa in the suburbs worth looking at, but the same evil prevails here also. Mr. W. Richardson seems to have made villa architecture his special study, and with some degree of success: the two designs exhibited by him (No. 27) are superior to most in the neighbourhood, and would be attractive anywhere.

Every architectural design exhibited has met with notice; so that our readers can form some notion of the meagreness of the display. Edinburgh is being outstripped in its architectural decorations by many of our second and third rate towns, which have nothing like its surpassing position for architectural effects; and, so far from discouraging the younger members of the profession by rejecting their drawings, it would be wise policy in the Academy to give them every encouragement to exhibit such of them at least as delineate buildings already or about to be erected, so that they might be subjected to a healthful criticism, even although they may not be attractive *as pictures*.

WORKS AND IMPROVEMENTS FOR THE CITY.

A DEPUTATION from the Institute of Architects have made another endeavour to induce the corporation of the city of London to keep open the vacant space near the Mansion House,—whether successfully or not has yet to be seen. Amongst other improvements contemplated in the City, there is a plan now under consideration by which the site of Newgate-market may be appropriated for public purposes. The market, as such, was abolished by a special Act of Parliament which came into operation in December, 1868. The City architect has prepared a scheme by which a large block of building may be erected. It is proposed to surround the building with a roadway, 30 ft. wide, and both light and air are insured to the new premises, and to the existing houses. Two passages will traverse the building, one from north to south, and the other from east to west. The ground floor will consist of sixteen shops, averaging 15 ft. wide and 35 ft. deep, and the first and second floors of offices and warerooms. The basements will be suitable for cellarage. The City wish to make a direct communication from Newgate-street into St. Paul's Churchyard, but are counteracted by the authorities of St. Paul's, who have unexpectedly come into a good thing in respect of the ground, in consequence of the abolition of the market, and are not disposed to meet the propositions of the corporation to make the opening.

An offer has been made to the City Commissioners of Sewers by the Dean and Chapter of St. Paul's to lay into the public way about 6,500 ft. of ground at the west end of the cathedral for the sum of 20,000*l.*, and this has been agreed to on behalf of the Commissioners. An application will be made by them to the Board of Works, to contribute towards the cost of the improvement. Other changes may soon be expected in Ludgate-hill, where several houses have been taken down, and in various other parts of the City. Surely the sum asked by the cathedral authorities is over large, remembering that it is not land from which they could derive any revenue? We long ago urged the desirability of setting back the railways around St. Paul's, and the improvements that might thus be affected.

Arrangements are being made to effect improvements in Long-lane, Aldersgate-street, and St. Martin's-le-Grand. A new library and museum will shortly be erected near the Guildhall, at a cost of 20,000*l.*, exclusive of the land.

A plot of ground has been set apart near the Metropolitan Meat Market, on which a handsome drinking-fountain will be constructed, and trees planted.

The Markets Committee of the Corporation have recently been called upon by the Common Council to inquire into, and report on, the question whether daily vegetable, meat, and fish markets should not be established in the City. In their report they state that they requested the clerks of the different vestries and district

boards of works in the metropolis to furnish them with the names of the markets in their districts, and any particulars with respect to their establishment, construction, and working. From the answers, they have arrived at the opinion, looking at all the circumstances, that it would not be advisable for the corporation at present to take any steps for the establishment of additional markets in the City. This report was unanimously adopted at a subsequent meeting of the Court of Common Council.

A correspondent writes,—"Have you observed the plot of land at the south-east angle of the Holborn circus which the City advertise for letting, and which will block out the view of St. Andrew's Church? Have we so many fine monuments in London that we can afford to shut out even the few buildings we have?"

Certainly not: every endeavour should be made to preserve such open spaces as can be formed, and to bring our public buildings fairly into sight.

THE MATERIALS FOR ECONOMIC BUILDING.

SIR,—Of the many interesting social problems which, at the present time, are forcing themselves upon the minds of thinking men, that of "The Materials for Economic Dwelling Houses," so ably treated in your impression of the 5th inst., may well occupy a foremost place, seeing that from its even partial solution may flow results of the highest importance to society—increase of comforts, increase of wealth, and last, though not least, increase of the term of human life. Having for some time past paid much careful attention to the subject, and carried my views into practical, and, I think I may add, successful effect, so far, indeed, as to induce me to patent the application in this and in foreign countries, I am encouraged to offer for adoption, or at least discussion, the plan which appears to me to meet most of, if not all, the requirements specified in your paper, viz., "Perfect shelter, rendering inmates to a great degree independent of the rapid and violent changes to which our climate is exposed; roof, walls, and floor so constructed as to resist the fury of the winds, the downpour or drift of rain or sleet, the exudation of percolating water, and, further, to keep out the extreme cold of winter, and the excessive heat of summer."

And now I must apologise beforehand for the shock which, in unfolding my plan, I shall be forced, however, reluctantly, to administer to all well-regulated architectural and building minds. I shall have to introduce to them a much-despised member of the family of building materials, whose name up to the present has been a term of scorn and reproach, and whose status has been only that of a Pariah among his fellows.

Let me at once take my moral "header," and confess to what I well know will be held heterodox—a firm and *reasonable* faith in the virtues of lath and plaster when employed as I shall presently describe. Nothing, certainly, could be more sweeping than your own condemnation of the brick of the period. Like the just now much-abused British workman, he has taken to bad ways: he is clumsy, ill-conditioned, and the truth is not in him; he is for working shorter hours whilst demanding longer pay; but, worst fault of all, he drinks sadly too much when he gets a chance, which, Heaven save the mark! is often enough in this moist climate of ours. Then as to his aristocratic *confrère*, stone, that gentleman's services are become too expensive for any but the most wealthy employers; besides, he is not at all to be relied upon (*vide* some of our public buildings), whilst in too many cases he is as confirmed a "soaker" as his argillaceous fellow-unionist.

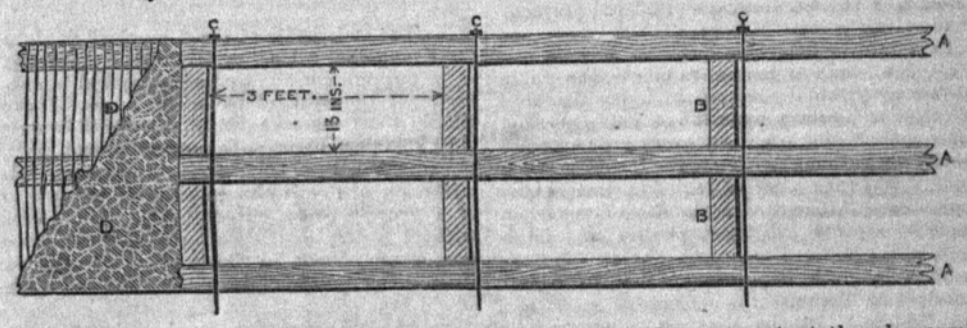
When employers of labour find their work-people too exacting and dictatorial, they are forced by the stern necessities of competition to introduce into their place machinery, which, almost automatic, can be easily directed by recruits from the "great unskilled" class-men, who, readily learning any simple mechanical operations, are only too content to better their condition by accepting not only lower wages than their predecessors, but being more amenable to the routine of workshop discipline: so, impelled by similar logic, when certain materials become costly, or bad, or both, a host of inventive minds at once ransack the store-house of nature, and, sooner or later, in the search, discover some substitute, which, by ingenious adaptation, often more than compensates for the previous deficiency.

The principal desiderata, then, for a healthy dwelling-house are, as stated in your article, that the substance entering into its construction should be non-absorbent and non-conducting. Now, brick, stone, and even granite, are to a large extent both; *ergo*, they do not fulfil the first and most important condition demanded by your argument. This conceded, where are we to turn for their *remplaçants?* Slate and iron, both of them, are non-absorbent; but, as you remark of the first, they are much too active conductors of heat and cold, whilst timber, pure and simple, though it approaches closer to what we seek, is not only too costly, but in many essential respects is completely *hors de concurrence*.

And now I will proceed to describe my system of building; and whilst entering upon the explanation, I may remark that I do so as no mere theorist, unfolding an even well-digested scheme, but I am writing from practical experience of the results of my views carried out and in use for a considerable period. On a slight base course of concrete I raise an open framework of wood, constructed on a new principle, to which I attribute most of the success of my plans.

This framework, when put together, is, without straining too much the sense of the Latin words you quote, a sort of "*opus lateritium*" and "*opus reticulata*" combined.

The annexed sketch will best describe the idea I wish to convey.



AAA are 1¼ in. battens (7 in. wide), extending the entire length or width of the building.

CCC are ½ in. iron rods, screwed at both ends, and furnished with nuts and washers, running vertically through holes bored in the centre of each batten, at distances of 3 ft. or 4 ft.

BB are wood, tile, or brick supports dividing the horizontal strings, and when braced together by the long bolts, CC, form the pillars or columns of the edifice.

DD shows a portion of the framework covered with laths, preparatory to plastering, cementing, or otherwise sealing the outer envelope of my wall, and the inner side of the wall is treated in the same manner. Not only are these bolts, CCC, used along the walls, but they are introduced at the angles in such manner as to make the building, when screwed up tight, to be as strong and rigid as a packing-case (which is mainly due to the wall being simply a congeries of cells), and, were it possible, such a framework might be turned over and tumbled about without fear of any serious injury in the way of displacement or breakage of the structure.

I need scarcely draw attention to the value of this quality for countries where earthquake shocks are violent or frequent.

In place of wooden battens I use sometimes sheet-iron, bent to a trough-like shape, on the edge of which I bolt wooden strips or strings, on which to nail the laths; and in place of wooden blocks or columns, I use short iron pipes, through which the bolts pass. I ought to mention that all the flues are collected, as far as possible, into one or two groups, and built of ordinary brick or concrete.

Having completed the skeleton walls, and introduced the several windows, doors, &c., I proceed to lath and plaster inside and out (or in place of plaster I use cement, as may be most conveniently or economically procured). I have thus 8 in. or 9 in. of wall made up of cellular cavities, containing, of course, air, and forming the best possible non-conducting shelter from our wet climate and ever-varying temperature.

It would seem as though that peculiar sensation of damp which assails us on entering many houses (especially if long unoccupied), and which arises from the walls charged with moisture, hanging like a wet blanket all about, had been reduced to a minimum by this system of construction.

Various buildings have been erected on this plan by myself and others, and some of them in very exposed situations; one, by the bye, where more than once the wind pressure has exceeded 30 lb. to the square foot. In another case, although the house has remained untenanted during the whole winter, and no fire except that of the kitchen lighted, the bright steel of the drawing-room stoves remained untarnished. The fact is, the inner is so separated from the outer envelope, that, however driving and drenching the rain may be, it can never find its way across the intervening space, so perfect is the insulation, and so comparatively slight is the substance of the exposed surface, that the least sun or dry wind suffices to remove all traces of wet. Between the moisture-charged brick or stone and this, there must, to the house-dweller, be as wide a difference as between damp sheets and dry to the sleeper; and it requires little acumen to determine which is likely to act most favourably on the health of the human subject.

Of the sanitary value of my system, I can only as yet speak theoretically, all the houses I have completed having so far been quite free from cases of sickness; but it appears to me that the *mephitism* of the French hygienists—foster-child of damp as it undoubtedly is—cannot possibly enter and lurk here; the first condition of its existence is wanting. Were the cavities in my walls hermetically sealed from the outer air, then they might possibly inclose a stagnation favourable to its development; but through them flows a constant though scarcely perceptible current, which must quickly and surely eliminate from the *maison infecte* the fell miasma of disease and death.

To prevent the absorption of deleterious gases, &c., by the internal wall, I use a stout washable paper, whilst on the outside I have already applied hair mortar, and rough-cast it with clean gravel, which gives a pleasing appearance as well as great durability. I have employed also for the inside walls and ceilings, in place of laths, wire network, which not only makes a room virtually fireproof, but gives a solidity and superior finish worthy the attention of the architect. Should there be any question as to the durability of lath and plaster, I would refer sceptics to some of the oldest buildings in this country, where it may be seen lingering on in a wonderful state of preservation, but just lacking that which, in my scheme, gives full force and effect.

Were it not that I am conscious that I have already trespassed too much on your forbearance, I could enlarge on other salient characteristics which commend this method of applying building materials to the consideration of thoughtful constructors. I am well aware that the system I have attempted to describe will provoke much prejudice and opposition, as I have found in other innovations afterwards approved and adopted by the world; but I venture to hope that the importance of the question will at least lead to its being fairly tested, more especially as its cost is considerably below that of the ordinary mode of construction. I may just remark that I am about to patent other improvements in construction, which I have reason to believe will prove valuable to the architect and builder.

W.

Education of Women at Cambridge.—It is reported that the establishment of classes for girls at Cambridge has proved remarkably successful. Upwards of fifty daughters of local tradesmen have availed themselves of the opportunity of receiving instruction from the most distinguished professors at the University. The lectures are a repetition of those which are delivered as a part of the University course. It is probable that several scholarships for girls will be established in Cambridge.

TEMPLE OF MINERVA POLIAS PRIENE, ASIA MINOR.

THE newspapers have mentioned that a valuable collection of ancient marbles, the result of excavations by Mr. R. Popplewell Pullan, to whom the readers of the *Builder* have often been indebted for accounts of foreign cities, was on its way to England, and would be placed in the British Museum. The cases have now arrived and are being unpacked. They contain fragments of the sculptural and architectural adornments of the temple, including portions of the celebrated statue of Minerva, mentioned by Pausanias, a colossal female head of a fine period, parts of several draped statues, heads of the Macedonian time, and fragments of the frieze, which in style closely resembles the reliefs on the Mausoleum, and is believed, in fact, to be by the same hand. Besides the marbles discovered by Mr. Pullan, there are thirty-three cases, the fruits of the labours of Mr. Wood at Ephesus, and two cases sent from Asia Minor by Mr. Dennis, whose researches among the tombs of the Lydian kings at Sardis were abruptly brought to a close by the want of funds.

Mr. Pullan has been engaged in excavating ancient sites with varying results, at different times, during the last eight years, at considerable risk, and may be congratulated on the result of his last undertaking. The temple as uncovered presents an octastyle plan; the steps and pavements being everywhere perfect. The walls of the naos and pronaos are standing in some places to a height of 6 ft., and the columns of the porticoes to a height of 13 ft. or 14 ft. The whole is built of white marble, put together with iron cramps and copper dowels, and without mortar, and all the carved ornaments are of the most elegant workmanship. There is no other ruin in Asia Minor of a good date in so perfect a condition. The temples of Arzani and Euromus, which alone are more complete, are of a much later period. The site is a magnificent one, being on the side of a mountain, above the plain of the Mœander, and opposite the marshes which surround the site of Miletus. At the time when Mr. Pullan encamped on the spot, three-fourths of the population were suffering from intermittent fever, and before he had been at work long he and his principal workmen were attacked by it. He was compelled to suspend operations. The wintry storms were so violent, that their encampment was blown down, and he was compelled to build a house in the ruins. Add to these *contretemps*, that he had frequent notice from the Berlin consul, and from the Pacha, at Smyrna, as well as from the local authorities, that there were brigands in the vicinity, and that if he remained it would be entirely at his own risk, and it will be seen that such investigations require no small amount of courage and resolution.

THE ANSTICE MEMORIAL, MADELEY.

THIS memorial, intended as an Institute and Workmen's Club Building, erected at a cost of 3,000*l.*, in memory of the late Mr. Joseph Anstice, ironmaster, has been inaugurated. When the form of the memorial was decided upon, the sum of 2,000*l.* was soon raised for the erection of the building, to which the more immediate friends of the deceased added 1,000*l.* as an endowment fund, one-half of which has been required for completing the building. The other 500*l.* will remain for endowment, so that the Institute opens free from debt, and with a sum in hand towards defraying the necessary expenses. The building has been erected from a design by Mr. Johnson, of London; and executed by Messrs. Nevett, of Ironbridge, builders.

The contract with Messrs. Nevett was signed in June, 1868, and the building itself completed in the summer of last year. It contains on the ground-floor a workmen's club-room for men, 31 ft. by 15 ft.; another for youths, 24 ft. 6 in. by 19 ft.; and a smoking-room, 18 ft. by 15 ft.; a reading-room, library, kitchen, scullery, hall-keeper's apartments, store-rooms, entrance-hall, and passages; and on the first floor a large hall or concert-room, 60 ft. by 39 ft. 6 in., with convenient retiring and committee-rooms, &c., occupying together the entire length and breadth of that floor. The hall is warmed with hot air, and the whole interior lighted with gas. The hall is furnished with benches; the club-rooms and reading and smoking rooms are provided with chairs and tables; a cooking-range is put up in the kitchen; and the whole building is now ready for immediate application to the purposes for which it was erected.

The encaustic tile pavements of the vestibule and ground-floor passages are due to the liberality of Messrs. Maw & Co., of the Benthall Tile Works, Broseley, by whom the same were designed, and at their expense substituted for the plain quarry pavements originally contemplated.

The workmen's club-rooms and smoking-rooms are to be available for the accommodation of a workmen's club or institute (should such be formed) so long as the same shall be conducted to the satisfaction of the subscribers; and the kitchen is also to be used for the supply of refreshments to club members, subject as in the deed expressed.

The library (when formed) and reading-room are to be available for the use of club members and others, in such manner and on such terms as the subscribers shall direct.

The large hall is (by permission of the subscribers, and on such terms as they shall prescribe) to be available for lectures, concerts, or meetings for charitable, benevolent, or useful objects, or for the purposes of rational instruction, social enjoyment, or harmless amusement; but not for meetings of a religious or political character.

The entire cost of the building was 2,879*l.* 7*s.* 5*d.*

PRIVATE BILLS.

THE 240 private bills of the session, amongst which street-tramway bills are so conspicuous, are passing steadily along their successive stages, as yet without attracting much attention. Up to the 23rd ultimo, 146 bills had been read a first time, and 71 bills had been read a second time: the latter number, and those read a second time subsequently to that date, are now waiting committee. Some of the bills which appeared in the earliest lists, have already disappeared, and since the first readings of some of those included in the number given above, some seven have either been withdrawn, or "put off for six months," which, of course disposes of such bills for the present session. The tramway-bills, of which there is a great number petitioned for, are all suspended for the present. It is to be hoped that if the tramway system is to be introduced, the Legislature will not repeat the blunder that was made in relation to railways, which have been laid down throughout the country at a profligate cost, absolutely without anything worthy of the name of a general plan. The promoters of the tramways are, in some instances, getting up public meetings; at Greenwich, for instance, last Friday; and obtaining unanimous votes from them in favour of their schemes; but it is unlikely that private companies will be permitted to acquire as much power as they propose to get over the public highways. The public are indebted to the spirit and enterprise of those who have made these projects popular, and such of them as have obtained Acts will doubtless be enabled to surrender their acquired rights upon good terms; but it will be best for the general interests that the question be taken up by corporate and official bodies for the public good, always provided that these bodies show a disposition to act with spirit and promptitude; but further delay will not now be submitted to without impatience. The Metropolitan Board of Works, the Manchester Corporation, and other powerful bodies, have entered petitions against the tramway-bills affecting their respective localities.

ENGINEERS IN INDIA.

SIR,—It may be in the recollection of the public that some excitement was recently occasioned by the issue of a Memorandum of the Government of India regarding the payment of commission by contractors to civil engineers. The Institution of Civil Engineers emphatically and indignantly repudiated the existence of any such custom in the profession, and eventually an explanatory apology was tendered to that body. The discussion attending the issue and explanation of this circular had the unfortunate result of eliciting the animosity felt by civil engineers against the officers of Royal Engineers; and the professional journals in England especially opened their columns to the denunciation of the military engineers in their departmental and social capacities.

As a fit pendant to these circumstances, I enclose a copy of a circular which has been sent from England to many civil engineers in India and would beg to inquire, whether this circular has the approval and sanction of the Institution of Civil Engineers and of Mr. Kinnaird, M.P. In conclusion, I may add that the civil engineers employed in Mysore have expressed their dissent from the statements made in this circular.

India. R. E.

The circular states that Mr. Kinnaird, M.P., has given notice of his intention to move next session for the appointment of a Committee on Indian Public Works, and that every effort should be made to induce the committee to report in favour of that measure.

It proceeds,—

"Each civil engineer in the department is requested, in order to assist Mr. Kinnaird in making a thorough investigation, to forward to him, in confidence, such information as he may be able to give, bearing upon the incompetency of military engineers, and the inefficiency of the department under their rule.

Such disgraceful failures as those of the suspension bridges near Calcutta, the downfall of the Custom-house sheds, the recent fall of a barrack at Nusseerabad, and the failure of Jubbulpoor Church before it was finished, should be described in detail. Instances of the absurd discrepancy between original estimates and actual cost of works, which must be known to every member of the department, should also be given in detail. These will help capitalists to determine how much confidence they may place in the assertions of the military engineers as to the great saving they mean to effect in the cost of railways. A comparison of the time which has been wasted by the department in carrying out such works as the Burrakur Bridge, the Grand Trunk Road, the Lahore and Peshawur Road, the Ganges and Baree Doab Canals, and the Godavery Works, with the time which contractors have occupied in making the Eastern Bengal Railway, the Chord Line of the E. I. R., and the Delhi Railway, will throw a good deal of light on the economy of military management, especially if accompanied by calculations of money lost by delay on the Government works.

Instances of the preposterous ignorance displayed by the Bengal engineers on all questions connected with iron-work, the use of steam, or other machinery and plant, and mechanical engineering in general; their opposition to all improvements; and their inveterate propensity to be 'penny wise and pound foolish,' should be pointed out."

MIDLAND COUNTIES MIDDLE-CLASS IDIOT ASYLUM.

IN reference to this competition the following report has been received from Mr. Waterhouse, the gentleman nominated by the competitors as consulting architect:—

"I beg to report that since my appointment as referee I have paid two special visits to Birmingham to inspect the fifteen designs submitted in this competition. After a careful examination of them, I have formed the opinion, as I have had the opportunity of personally explaining to the committee, that the design bearing the motto 'Comfort and Convenience,' is, on the whole, the best as regards its internal arrangements, its external architectural effect, and its general conformity to the conditions of the competition. The design throughout is marked by great simplicity in its general construction, and in its plan. The first-class patients' rooms are 12 ft. square by 12 ft. high. The dormitories for second-class patients give 650 cubic feet per bed, and the infirmary, 1,050 cubic feet.

The buildings proposed to be erected first would accommodate 104 patients, viz., thirty-two first-class, and seventy-two second-class, while the entire design shows accommodation for 268.

With regard to the important question of cost, the authors of 'Comfort and Convenience' frankly state their opinion that the sum named, 8,000*l.*, would be insufficient to carry out the first portion of the buildings, though I observe that some of the other competitors are sanguine of being able to accomplish it. I am myself inclined to think the latter are mistaken; but if it should so happen that building operations can be carried out in the neighbourhood chosen by the committee at an exceptionally low rate, I must still express my opinion that the design 'Comfort and Convenience,' in the matter of cost, would be the most advantageous of the whole number for the committee to adopt, on account of its simplicity, and the almost total absence of any mere ornamental features."

We are informed that the authors of the successful design are Messrs. Matthews & Quilter, of Cloak-lane, London. The design will, in due course, be submitted to the Commissioners of Lunacy for their approval.

AGITATION IN THE BUILDING TRADES.

A FEW weeks since some of the master builders of the metropolis, looking at the large amount of unemployed labour in the market, resolved to make an effort to get the rate of wages reduced from 8*d.* to 7½*d.* per hour, and for this purpose it was arranged that notices should be given by these firms, in the first place, to the carpenters and joiners, of the intended reduction. This having been done, the men stated they should resist such reduction by every means in their power, and from this, or some other cause, the only one where it was attempted to enforce the reduction, and where the whole of the men accordingly struck. After a fortnight's struggle, the firm found itself unable to obtain a supply of competent workmen at the reduced rate and

were compelled to re-open the establishment as an 8d. per hour shop, but refused to re-employ any of the men who had struck work. Under these circumstances, subscriptions are being collected through the trade for the support of the men, and it appears that several men who have collected subscriptions in various shops have been discharged for so doing. A meeting of carpenters and joiners was held on Saturday at the King's Head, Ebury Bridge, Pimlico, when it was resolved to support those who had been thus discharged or refused employment.——A movement is also on foot amongst the metropolitan carpenters and joiners for obtaining a reduction in the present hours of labour; and at a meeting of 100 delegates on Saturday, a committee of thirty was appointed for the purpose of bringing the movement publicly before the whole trade, with a view to combined action during the coming season.——At a meeting of building trades operatives in Northampton it has been resolved that payment by the hour from May next be required of the masters, and that the rate per hour be 6d. for all skilled workmen, and others in proportion. A code of rules is also to be submitted to the employers for their approval, including a proposal to refer differences to arbitration.

PROPOSED WORKS FOR MIDDLESEX.

LAST week, at a meeting of the magistrates of the county of Middlesex, a report was submitted by the visiting justices of the House of Detention, Clerkenwell, stating that this prison was insufficient for the reception of all the untried prisoners committed thereto, and that it was necessary that it should be enlarged. After a good deal of discussion, a motion was submitted to the approval of the Home Secretary, that steps be taken for enlarging the prison, according to the plans submitted to the magistrates. Accommodation will be provided for 200 additional prisoners. The estimated cost of the proposed extensions is 25,000*l.*, including the purchase of land.

A letter has been addressed to the Middlesex magistrates by the Home Secretary, pressing upon their attention the urgent necessity of providing additional asylum accommodation for the pauper lunatics of the county of Middlesex. The representations made to the Home Secretary by the Commissioners in Lunacy and the local authorities, are so strong that he can sanction no further delay, and he hopes that steps may be at once taken to erect another asylum. A special committee has been appointed by the magistrates to take the matter into consideration.

PROFESSOR SCOTT ON ARCHITECTURE, AT THE ROYAL ACADEMY.

LECTURE I.—*Continued.**

IN our Norman buildings colonnettes are for the most part built in the solid of the piers, which would suggest that they are not there in the earliest stage of their use.

The principle once adopted, there seems no limit to the variety of which it is capable. Shafts may be substituted for *all* of the arch-orders, or for such only of them as may be desired.

Where the arch consists of more than two orders, a half-column of larger size may be made to support two or more, and smaller ones may flank them carrying single orders. Where, again, the lower order is wide in its soffit, it may be carried either by a large semi-column or by coupled colonnettes; and where there are three orders, the same may be applied to the front, bringing the pillars to a uniform design on all of its sides.

We have already seen that single columns may be used to carry arcades of two or more orders, either by breaking their abaci into receding angles, to fit them to the orders of the arches, or by making round or octagonal abaci large enough to receive them; and such single columns may be alternated with clustered piers. There is, however, another extensive variety of pillar compounded of the two.

Let us suppose a single column supporting arches of a single order, and that we desire to extend the arches to *three* orders, retaining the same main bearing-shaft. We may imagine the additional orders to be super-added on all sides of the original square springer, and additional colonnettes (attached or detached) added round the original bearing-shaft to receive them. The same may be applied to an octagon, placed either angularly or in its usual position. The process may be carried a step farther, and eight colonnettes be set round the original bearing-shaft. In St. Mary's Abbey, at York (towards the end of the twelfth century), we have an instance of sixteen colonnettes thus placed round a bearing-shaft, but only eight of them carry separate orders; and a little later, in the cathedral at Genoa (the work apparently of a northern French architect), we have no less than twenty-four colonnettes similarly ranged round an octagon; though here, again, only eight are represented in the plan of the abacus or of the base when it rests upon the floor, the others being introduced probably for the relief produced by the varied colours of the marbles of which they are composed.

A little later the colonnettes themselves become grouped in threes and fours, and their edges often filleted or "keeled," that is, decorated by an arris or edge projecting from their round surface. Thus, at Lichfield, in the older portions, groups of three shafts united into one, and carrying a common abacus, were set on each side of an octagonal bearing-shaft. At Wells, similar triple shafts were set alternately against the faces and in the internal angles of a cross-formed nucleus, with alternately square and octagonal abaci.

My purpose, however, is not to enumerate all possible varieties of clustered pier, but to explain its principle, and at the same time to show how unlimited an artistic element was deducible from an intent thus founded on the natural conditions of arched construction. To go much farther would carry us on prematurely into the succeeding styles, and would be also anticipating another cause, which carried on the principle to a still further development. I allude to groined vaulting, of which I shall have to treat in detail when I reach it.

Before, however, I quit the subject of arches and piers, I must say a few words on the application of their principles to doorways and windows; though each must be viewed as the subject of some future lecture.

Doorways differ in no degree, as to principle, from archways, excepting in having, at some point in the thickness of the wall, more or less recessed at pleasure, what Professor Willis calls the "doorway plane;" that is to say, one of the arch-orders so formed that the door may be hinged to it, and may shut against it. The actual opening of the door may or may not be stopped on this plane to a square heading, the arch over it being filled in with a tympanum, plain or sculptured; or it may be altered from the form of the main arch to some shape having less height. In all other respects the principles already stated apply equally to doorways as to archways. The interior, however, has to be varied if the door fills in the arch-form, with a view to facilitating its free opening; but this is a practical point not needful to be here gone into. The orders of arch-mouldings in a doorway often continue down the jambs, as in one of the magnificent doorways at Malmesbury Abbey; or they may be replaced by colonnettes or pilasters, or these methods may be united in the same doorway,—just as in another door at Malmesbury, continuous mouldings alternate with colonnettes,—and the arches, jambs, and capitals, and even the shafts of the colonnettes, may receive any degree of sculptured enrichment.

The doorway being a point on which much architectural character was concentrated, and great depth being necessary to give the required effect, it was customary to thicken the walls at the doorways by various expedients, so as to obtain depth enough to give several orders of arch-mouldings; this increased thickness was covered over by gables, and by other means.

The width, too, of the jambs of doorways is often increased, and more space gained for enrichment, by giving to each order in the jamb a larger space than would otherwise be necessary of square face between the shafts.

In some cases, also (as in the exquisite doorway in the Castle at Durham), there is a small arch order which continues down the jambs between the principal orders, and adds much richness to the effect.

In later examples, two ranges of shafts were often introduced; the outer ones carrying the orders, and the inner ones having capitals lost under the main capital, as if carrying an imaginary order hidden within the visible mass of the arch. These are, in fact, the parallels of the supernumerary shafts I have mentioned as often existing in clustered piers. Thus, in St. Leonard's Priory, Stamford (a work of the twelfth century), we find two ranges backed by a plain splayed surface. In the Galilee at Ely (somewhat later), the second range is backed by large hollows between salient mouldings; and again at Lichfield, the back range is, as at Stamford, placed against a splayed surface, but relieved by ranges of large toothed ornaments running up behind each of the front shafts.

The windows, also, differ from mere arched openings in having a *functional* plane, which occupies one order, and is needed to receive the glazing. The orders are never so numerous in windows as in rich doorways, rarely exceeding two besides that which receives the glass. The inner side is usually splayed, to diffuse the light through the interior. It is not my intention in this lecture to treat in detail either of doorways or windows; but having stated that the system of receding arch-orders was one cause of the origin of window tracery, I will say a few words in explanation of my statement.

Many early windows and window-like openings—such as those with the triforium galleries of churches—are divided into two or more portions by pillars and small arches in the inner plane or order; the outer order or orders embracing the whole, and the plane of the inner or functional order forming a second wall-space over the heads of these subordinate arches. Thus the triforium at St. Bartholomew's is divided into *four* subordinate arches. This window plane, as it may be called, is often ornamented in different ways, and occasionally, even in Norman work, is pierced. At a later stage this piercing becomes systematic, and has received the name of "plate tracery," the *plate* being the window plane or order. It is simply the piercing of this plane of the functional order of the window arch; and as it is clear that this piercing developed itself into window-tracery, so is it equally manifest that the plane thus pierced originated in the division of the window-arch into receding orders; and, consequently, that traceried windows were a natural result of the conditions of arcuated architecture. The subject of windows being quite sufficient to occupy a separate lecture, I leave it for the present to go on with the more elementary questions resulting from the conditions I laid down at the outset.

You will have noticed that having in those prescribed conditions divided my subject into two great natural heads,—viz., the *arching* over of openings in walls, and between piers; and the *vaulting* over of the spaces enclosed by walls or ranges of piers,—I have hitherto dealt exclusively with the former; and that, as the forms of piers and clustered columns are influenced as much by the requirements of the *vaulting* as of mere *arches* they have to support, I have been obliged to leave my description of their forms imperfect; and as it is my wish to treat of vaulting as systematically as I am able, I must beg you to allow this incompleteness to remain till it is incidentally filled up as we proceed with this, the second great elementary division of arcuated architecture.

It must be clear, even on the most superficial glance, that the vaulting over of extended areas is a matter of far greater intricacy and requiring vastly more thought and contrivance than the mere arching over of an opening in a wall; and, though its primary elements are simple, I must beg you to follow me over easy ground,—and ground already trodden in my previous lectures,—because these early and simple steps are needful to the due appreciation of the more advanced and complex ones which we shall presently have to consider.

The simplest elements of vaulting are—first, the covering over of a rectangular space inclosed between parallel walls by means of a semi-cylindrical vault, usually known as a "*barrel vault*;" and secondly, the covering over a space inclosed by a circular wall, by means of a hemispherical vault or *dome*.

The first is the prolongation of an arch in a direct line at right angles to its plane; the second may be conceived as generated by the revolution of an arch upon its vertical axis.

I will keep, for the present, to the development of vaulting from the first of these types. We will first suppose that, while limited by constructive convenience to some moderate span, we have occasion to vault over an area of double that width.

The most natural expedient which suggests itself is to divide the space into two widths by an arcade whose top ranges on a level with the springing of the vaulting, and on this and the outer walls to place twin and parallel barrel vaults.

This was a system at first largely made use of, as we may see in some of the covered tanks or piscinæ of the ancients, and in the galleries of the Colosseum. It is clear, however, that this is an imperfect covering for a single room or hall, not only from its severing it too much into two separate areas, but from its placing so much of

* See p. 160, *ante*.

the covering above the level of side windows, and thus practically reducing the available height of the walls; not to mention its heavy effect.

Let us see how these imperfections may be obviated.

The solution of the question may have arisen from a different and accidental case. Let us suppose two corridors, each covered by a barrel vault, crossing each other at right angles. It is easy to see that these vaults must, by their intersection, generate angles running diagonally from corner to corner of the crossing of the corridors, and that these angles of intersection would assume curves of an elliptical form.

This square of intersection would in fact be found to be vaulted on a system previously unthought of.

Let us next suppose *twin* corridors, severed only by a wall, crossing two other such corridors, all similarly covered by barrel vaults. Instead of the simple intersection of our previous case, we now have a group of four, or *two pairs* of such intersecting vaults, meeting in the centre on a mere frustum of the partition walls reduced to a square pier, from whose angles spring four of those edges of intersection before described.

This, then, contains the solution of the problem under consideration, for, returning to our first case of vaulting a hall of double width, we may, by repeating as many as we may need of these pairs of intersecting or "groined" compartments, such as we have generated by the last process, effect our object in a perfect manner; the vaults being all of equal height, and the two widths being practically united into one, while the walls cease to be stunted of their full height, and room is left in them for windows reaching nearly to their top.

The same process may be applied to an area of any extent by repeating the ranges of piers, or limited to a single span or to a single compartment, at pleasure; and in all these cases it has the advantages of giving all the internal cubic space, and all the height of wall of which a vaulted area is capable; while, by concentrating the lateral pressure upon points at convenient intervals, where it may be readily resisted by external buttresses, it leaves the intervening wall-spaces at liberty to be pierced by windows, doors, or archways at pleasure.

The Roman builders usually strengthened their vaulting by narrow strips of brickwork or cut stonework from pier to pier, constructing the rest of inferior materials. Then groined vaults were similarly fortified at the lines of intersection; but, as the whole was usually encrusted with plaster, these constructive expedients had no effect on the appearance. Sometimes, however, in their barrel vaults (as in the piscina at Baiæ, mentioned by Professor Willis, and in the corridors of the Colosseum), we find these strengthening strips appearing as ribs projecting downwards from the surface of the vaulting, and supported by projecting piers.

The application of this to *groined* vaulting is an obvious step, and adds vastly both to its strength and beauty. Let us suppose a length of vaulting so divided; we find at once that we are getting into a very sightly system, and one susceptible of excellent architectural treatment. Let us then, before proceeding to more advanced or intricate developments, apply to what we have reached the same process of architecturalisation which we have gone through for mere arching.

Now, so far as relates to a barrel vault, it is evident that when divided by transverse ribs those may be carried by pilasters or by colonnettes just as the orders of an ordinary arch; and if we further mould or otherwise decorate the ribs and continue the capitals as an impost along the springing line, we have given a very fair amount of architectural character to the simplest form which vaulting can assume.

To pass on to the simplest form of *intersecting* or *groined* vaulting, it is equally clear that columns may be substituted for the square piers which are its normal supports.

In my theoretical description of this form of vault, I supposed the springers which are next to the wall to rise directly from its face; but in practice it is better that they should rest upon projecting piers; and it is obvious that for these pilasters or columns may be substituted. The crypt under the Church of the Holy Trinity at Caen is a good example of this class of vaulting. When we apply the transverse rib to this vaulting we give it at once a strictly architectural character, as every compartment is now distinctly defined.

The complete plan of the springer upon a detached pier now takes the cross form, suggesting the substitution of a cluster of four shafts round a square, or of a larger column, with a capital broken into the cross form. Where, however, the weight to be carried was small, as in crypts whose vaulting supported only the floor above, this enlargement of the pier was obviated by making the ribs die out at their springing one into another, and the groin to commence a little higher up; or sometimes by the awkward expedient of making the outer curve of the rib *eccentric* with the inner one.

Where we have already clustered pillars carrying a main arcade, the presence of vaulting on either side adds a new member to the pier, both behind and in front; and if, as is usual in churches, the central vault springs from a higher level, the additional shaft on that side runs up *through*, or rather *by*, the capital of the pier till it reaches the higher springing, thus emphasizing the division of the bays throughout their entire height. This multiplication, however, of shafts is by no means essential, as the ribs may be brought, by a little management, on to the capital of a single column, which supports the arcades, and on their other side shafts may be carried up upon corbels to receive the higher groining.

Having said enough upon this simple case of groined vaulting to show that it may be made both the source and the vehicle for architectural treatment of a most reasonable kind; and, as you will readily imagine that its ribs and their supporting capitals, corbels, and colonnettes, may receive *any amount* of sculptured enrichment, and its vaulted surfaces any degree of decoration in the form of painting or mosaic work, I will here close my lecture, hoping that, though its subject matter may have appeared somewhat dull and its arguments almost self-evident, it may, nevertheless, have placed simple and familiar facts before you in a form more systematic than that in which they might otherwise have presented themselves; and that, like the definitions and axioms of Euclid, it may be serviceable in preparing the way for more intricate and less obvious matters of consideration which I shall have to bring under your notice while following out, in my succeeding lectures, the principles of vaulting into those more difficult and ornate forms which became so important an artistic element in the subsequent developments of Mediæval architecture.

MASONRY: DESIGN AND CONSTRUCTION.

THICKNESS OF MORTAR-JOINTS IN MASONRY AND BRICKWORK.

THE following remarks were commenced in reply to a question in the *Builder* as to the advantages, or otherwise, of thick or of thin beds of mortar. They have been extended.

The quantity of mortar which may safely and with advantage be used with bricks, must in a great degree depend upon the quality of the mortar, and the purpose to be served by the brickwork. Some mortars swell (expand) in use; others shrink. The best samples of mortar in setting become hard and tough; poor samples remain soft, and crumble on exposure. A thin bed of the best mortar for such a work as a tall chimney would not be so strong as a thick bed, because in a thin bed there will be parts where the best bricks will be in contact, even where ⅛ in. thickness of bed may have been specified for, and this thickness of bed and joint may show on the face of the work. With common bricks, a bed of ¼ in. of mortar will leave rough projecting portions of the bricks in contact. Good mortar, when set, is, as we have just said, hard and tough; and to secure the whole strength it is capable of giving, the entire bed and joint must be full, so that the whole area of beds and joints of bricks shall be cemented by intervening mortar. Bricks and tiles of the best kinds, and mortar as composed and used by ancient Roman builders, appear to be indestructible under any ordinary action of the elements. Samples of Roman masonry—rubble and brickwork—occasionally dug up in London, and at other Roman sites in England, do not show any signs of decay, and in Italy entire structures remain sound and firm, with the exception of mutilations purposely made, wantonly or during war, in attempts to utterly destroy them. In these old works and ruins the proportions of mortar are usually about one-third, and sometimes one-half. The best rubble-work now consists of one of mortar and grout to three of stone, and the soundest rough brick-work, as in bridge-abutments and retaining-walls, one of mortar and grout to four of bricks. There are arches of Roman work constructed of flat tiles set in beds of mortar almost, if not quite, as thick as the tiles, and those structures which have been destroyed by man (probably in war) show sound fractures and materials undecayed.

The strongest work at the Liverpool Docks is the granite rubble, consisting of one of mortar and grout to three of stone. The late Jesse Hartley, during the last twenty years of his life and practice, constructed dock and river walls of granite rubble masonry. The first twenty years he used ashlar masonry, hewn to an exactness and truth such as no other engineer ever obtained; the blocks of stone varying from 20 cubic feet up to 200 and even 300 cubic feet. These blocks were set, stone and stone, over the entire areas of beds and joints, the backing being rubble. It is, however, the rubble backing which gives strength and endurance; and this will be sound when the ashlar has been crushed, or has decayed.

If these remarks are read by any young architect who wishes to construct cheap, sound, and enduring works, we recommend rubble to his notice for heavy masonry works, and for brickwork thin, hard, and well-burned bricks, set in thick beds of good mortar. Even for public buildings the rule holds good, as at Windsor Castle, where the rough-faced wall-stones are set with thick beds and joints of good mortar, stuck with spalls of flint. Compare the resistance of this work to atmospheric influences with the masonry at Westminster in the Houses of Parliament. The walls of Windsor Castle will be sound, in their rough strength and beauty, long after the elaborately-carved stonework of the Westminster Palace has mouldered away. The cost of the two sorts of masonry is very different, probably as one to five, and in some cases one to ten, the rough work being, of course, the cheapest.

With regard to masonry and brickwork construction generally, very much more may be said, and especially about design. The "five orders" continue to be the alphabet for one set of architects: Gothic is the style chosen by another set, the Rennaissance and the Elizabethan style of architecture influencing others. Our modern club-houses, public offices, and private residences give us rusticated basements, windows with pediments beneath string-courses, and heavy cornices which bolts and cramps can only keep in place. Columns should have something to support which could not otherwise be supported. Pilasters should give strength where it is required; pediments, string-courses, and cornices should act as protections from the weather, and ought not to be present where it is impossible for this purpose to be served. Rusticated ashlar masonry is not necessarily stronger, by reason of the amount of projection given to the face, as the true strength is in the breadth of bed, truth of workmanship, and in the care and mode of setting. If the breadth of bed to ashlar masonry is cut away to form a deep rustic joint, then is the work so much weakened by the process. With respect to design and construction in masonry, will one architect consent to design a public building in an original manner, regardless of all example and precedent, and not use one moulding or ornament which does not grace construction and is useful? Let him think over the purpose or purposes to be served by plinth, rustic, column, pilaster, architrave, pediment, impost, arch, key-stone, balustrade, string-course, cornice, and every other detail, and discard one or all if plain work will be sufficient. Ample scope for ornament may be found in the useful, and it will then be discovered that economy and power of endurance are on the side of that which is useful, and also that consistent decoration is most beautiful. Masonry will then be in keeping, as there will be harmony and breadth. Old Lambeth Palace, consisting of rubble, shames florid structures in endurance; and the noble massing and fine outlines of Windsor Castle would not be improved by converting the walls into finely-tooled or polished ashlar masonry. London smoke, dust, and dirt soon disfigure hewn ashlar, which is deeply rusticated, and elaborately moulded; and carved masonry, such as that executed at the new Houses of Parliament, must inevitably and rapidly decay. The Windsor Castle coursed wall-stone is dirtied, but is not decayed as hewn moulded and carved masonry is. Thin courses of hard wall-stone and thick beds of good mortar last longest, even in palaces and in churches.

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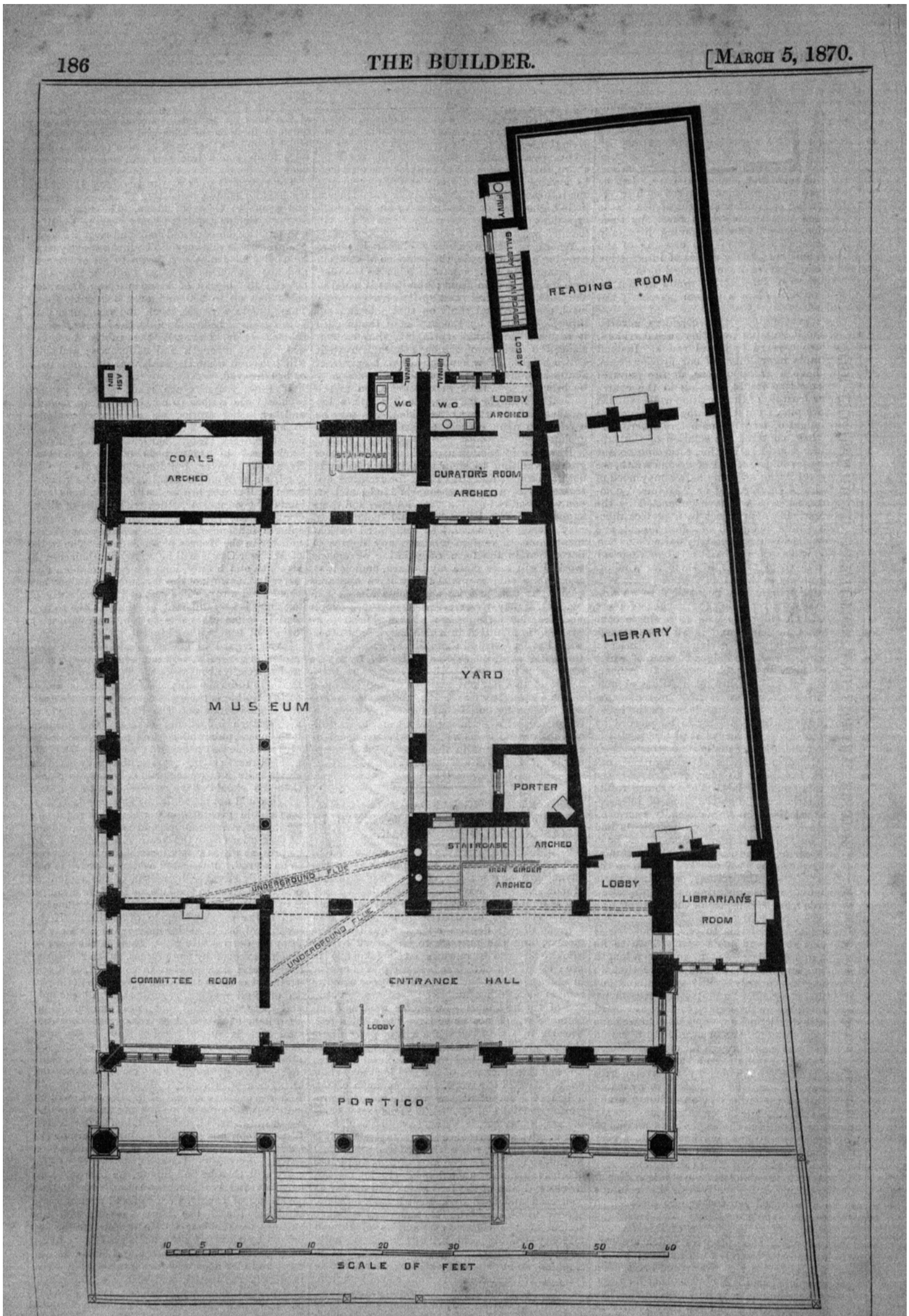

THE PHILOSOPHICAL INSTITUTION, BRISTOL.

Plan of Ground Floor.

THE PHILOSOPHICAL INSTITUTION AND LIBRARY, BRISTOL.——Messrs. Foster & Ponton, Architects.

THE PHILOSOPHICAL INSTITUTION AND LIBRARY, BRISTOL.

THE building for these amalgamated institutions, at the top of Park-street, close to several other important edifices, is progressing towards completion, and in our present number we publish a view of it, and the plan of ground floor. In our volume for 1869 we gave some particulars of the construction.* Messrs. Foster & Ponton are the architects, and Messrs. Warburton the builders; the amount of the contract is 10,000*l*. Farley Down red stone is used for the exterior. The style is French Gothic. A flight of steps, 32 ft. wide, leads to an open portico, having columns, with carved capitals and bases, from which spring seven pointed arches. The portico is laid with Coalbrook-dale tiles, and is built throughout of freestone. The front wall is divided into the same number of bays, each one corresponding in dimensions with the arch which faces it. The three middle ones are devoted to doorways, and the remaining four to windows which light the entrance-hall and offices. These windows each consist of three lancet-headed lights, surmounted with a traceried light, the whole inclosed in a pointed arch, resting on carved shafts, with foliated capitals. Passing through the entrance-doors (which slide on iron rails) we get into the entrance-hall. There is a committee-room to the left, and directly in front of the entrance is the door to the ground-floor museum. This is a large apartment 22 ft. in height. Running down the middle of the room is a series of octagonal freestone shafts, from which spring arches, for the support of the floor above. The room is lighted by five windows on the Baskerville-road side, of geometrical tracery, exactly the same as those described in the front, and four on the opposite side, which looks into a small yard. From the entrance-hall access is also gained to a spacious library, and a reading-room, librarian's-room, curator's-room, and all necessary offices. The reading-room and library are lighted by means of a lantern roof. The height from the ground floor to the eaves of the lantern is 36 ft. A gallery runs round both rooms, communicating with a ladies' reading-room, and on the same level as a mezzanine floor. A flight of steps from the entrance-hall takes us to the first floor, which is devoted to a larger museum, covering an area of 4,864 square feet, and 24 ft. high.

MR. PEABODY'S GIFT.

THE statement of the trustees for the year 1869 has been issued. They now possess, under the first trust, four groups of buildings, situated in Spitalfields, Islington, Shadwell, and Westminster; providing collectively accommodation for 498 families, irrespective of the rooms assigned to the superintendents and porters. A fifth range of four blocks at Chelsea of somewhat different construction, affording tenements for sixty-eight families, is approaching completion. The tenements are of one, two, and three rooms each, and the weekly rent varies from 2s. 6d. to 5s. 6d. according to the number of rooms and desirableness of location. The trustees also possess a site at Bermondsey not yet built upon. At all the buildings except Shadwell there is an increasing demand for dwellings in excess of the accommodation. Under the trust the trustees have procured land at Brixton, Chelsea, and Southwark. The sum total of the gifts to the two trusts amounts to 500,000*l*.

SIR,—The Peabody Buildings at Islington, containing 155 tenements, cost 31,690*l*. Are these figures correct? If they are, I think there has been great loss or extravagance somewhere. These 155 tenements consist of what might be called "dwellings" of one, two, and three rooms, the greater portion, namely 104, having only two compartments.

Now, sir, 155 into 31,690*l*. gives a cost of 206*l*. to each tenement, or about 99*l*. per small room. It does not require any very intimate knowledge of the building trade to know that six-roomed houses can be built for 160*l*. apiece, which gives about 27*l*. per room, instead of 99*l*. How is this startling difference to be accounted for? The rental of the Peabody tenements is about 2s. per week for each room, producing, if all let, something like 1,600*l*. per annum; from which income deductions must be made for interest on the purchase-money of the land; or, in other words, ground-rent, repairs, rates, and taxes, depreciation of capital, and management, to say nothing of losses by defaulting tenants. It will, then, be seen that the outlay will barely pay 2½ per cent., although the rentals are higher than usually paid in ordinary houses; for instance, six-roomed houses are let at from 8s. to 10s. per week, being about 1s. 8d. per room, which will pay the owners 9 per cent. If the committee are satisfied in receiving 2 to 3 per cent. for the money invested, they ought to be able to let rooms, say 10 ft. or 12 ft. square, at 11d. per week, instead of 2s. As a proof, take a 6-roomed house built in blocks of four, with one large wash-house attached. The cost of building each, say 160*l*., at 2½ per cent. equal to 4*l*.; ground-rent, say 2*l*. 15s.; rates and taxes, repairs, depreciation,' &c., 7*l*. 10s.; making 14*l*. 5s. per annum, equal to six rooms at 11d. per week.

Presuming the foregoing calculations are correct, allow me to ask you whether the poor of London would not be more benefitted by being provided with rooms at less than 1s. per week in ordinary houses, than by paying 2s. for the same accommodation in large buildings?

An argument may be used in favour of large blocks of buildings containing several floors, because it curtails the space, and thereby saves the land in ground-rent. This argument however, will not hold good as regards the "Peabody" dwellings; for it will be seen that the cost of the ground for the Islington block was 8,646*l*. 5s. 6d., the interest of which, taken in the shape of ground-rent, and apportioned to 323 rooms, or to dwellings of six rooms each, would be equal to about 8*l*. per house, which is a monstrous rent, there being plenty of land to be had at 3s. 6d. or 4s. per foot, which would not exceed 4*l*. per house, with a sufficient depth (if built in blocks) as would give a larger proportionate extent of yard or play-ground than falls to the lot of the tenants of the Peabody Buildings.

WM. PAICE.

* Vol. xxvii., p. 710.

THE LATE MR. WILLIAM BURN, ARCHITECT.

WE record with regret the death of one of the oldest members of the profession, Mr. William Burn, which took place on the 15th of February, at his residence, 6, Stratton-street, Piccadilly.

Mr. Burn was born in Edinburgh in the year 1789, and commenced his professional career in the office of the late Sir Robert Smirke, where he was associated with some of his principal works, and in particular with Covent Garden Theatre (destroyed by fire), the erection of which he personally superintended. On returning to Edinburgh, he succeeded to the business of his father, which he greatly enlarged, and steadily matured into the most extensive and influential connexion in Scotland. In the year 1844 he removed to London, and from that period up to the time of his death his career was one of continued success.

Mr. Burn's speciality was Domestic Architecture, and he possessed to a very remarkable degree skill in planning. His plans for private houses have the reputation amongst those who know them of being models of simplicity, compactness, and convenience. His works are very numerous: we may allude briefly to Stoke Rockford, Lincolnshire, for Mr. Christopher Turnor; Revesby Abbey, in the same county, for Mr. James Banks Stanhope; Lynford Hall, Norfolk, for the late Mr. Lyne Stephens; extensive works at Eaton Hall and Fonthill, for the late Lord Westminster; and at Knowsley, for the Earls of Derby; Dartsey, for the Earl of Dartsey, and Castlewellan, for Earl Annesley, both in Ireland; the New club, Edinburgh; Buchanan House, near Glasgow, for the Duke of Montrose; Montague House, Whitehall, and numerous works at Dalkeith, Bowhill, and elsewhere, for the Duke of Buccleuch; as illustrative examples of his very extensive private practice.

Mr. Burn for some years held the appointment, under Government, of consulting architect for Scotland, and performed the somewhat thankless office of a judge in the competition for the new Government offices.

Mr. Burn had a great objection to publicity, and resolutely prevented, so far as was practicable, the publication of any of his plans; not alone because of wish to avoid criticism, but on the acknowledged grounds that he saw no reason,—great mistake,—why he should enable others to derive advantage from them. The result is that his name is much less known than that of most of his contemporaries, in proportion to the magnitude of his works; and it can scarcely be claimed for him that he did much to advance the general progress. This, however, is not the best occasion to take exceptions: we may find another. Suffice it to add that Mr. Burn was a man of ability, and in his own circle was greatly esteemed. He was buried on the 19th ult. at Kensal Green. Mr. Burn is succeeded in his practice by his nephew and partner, Mr. J. Macvicar Anderson.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

Pugin Travelling Studentship.—Ten candidates submitted drawings and testimonials for the Pugin Travelling Studentship, and the council have elected Mr. Ernest C. Lee, of 19, Great James-street, Bedford-row, as the Pugin Travelling Student for 1870. The council spoke well of the drawings of three other candidates, viz., Messrs. W. Scott Champion, W. Henman, and W. Penstone.

Professional Practice.—Attention was called to an Appendix (No. 3) in the printed Parliamentary Report on Hungerford Bridge and the Wellington-street Viaduct, headed "Papers handed in by Mr. Cole, C.B., 3rd May, 1869," and containing certain recommendations in regard to professional practice much at variance with the present system sanctioned by the Institute.

After some discussion at a special meeting, it was

Resolved:—"That the consideration of this subject be referred to a committee consisting of the vice-presidents and honorary secretary, with power to add to their number."

The Royal Academy Exhibition.—The correspondence which passed between the council and Mr. Sydney Smirke, R.A., on the subject of the accommodation provided for architectural drawings at the Royal Academy Exhibition, has been taken into consideration. In his last letter Mr. Smirke stated that the South-eastern Gallery at the Royal Academy (41 ft. by 31 ft.) was set apart for the exhibition of architectural drawings; and, in the event of spare wall space being left, for such water-colour drawings as would not interfere with the effect of the other works exhibited in the same Gallery.

After some discussion it was

Resolved:—"That the council be instructed to acknowledge the courteous letter received from Mr. Smirke, and to request him to bring under the notice of the Royal Academy the importance of leaving to its architectural members the selection of drawings sent to the Royal Academy for exhibition, which course, if adopted, would, in the opinion of this meeting, meet the wishes of the architectural profession generally."

It was further

Resolved:—"That this Institute invite its members to do their utmost to promote a good architectural exhibition at the Royal Academy this year."

Architectural Art Classes.—It has been resolved—

"That a donation of 50*l*. be contributed, out of the funds of the Institute, towards the establishment (and first year's expenses) of the Architectural Art Classes now in course of formation under a general committee of management."

These classes will meet, we have already mentioned, at the Architectural Museum, Westminster.

SINAI AND CUP MARKINGS.

IN the course of a lecture at the Royal Institution, on Friday, the 25th ult., by Captain Wilson R.E., on the results of the recent Ordnance survey of Sinai and the adjacent wilderness, the lecturer said that in various parts of the wilderness were to be found great numbers of clusters of small stone houses, much in the shape of beehives, having walls which began to taper in at the height of 2 ft. from the ground. The interior of these houses is left perfectly rough, and the projecting angles of the stones must have been a fertile source of annoyance to the inhabitants, whoever they may have been. The doors are small apertures, generally 21 in. square, or thereabouts, and the Bedouin tradition is that they were built by the children of Israel to protect them from mosquitos, which were sent as a punishment to them. There were also large numbers of stone circles, which were places of sepulture. In the centre of rings of stone, bodies were found in kists, interred after the manner of the most ancient interments discovered in these islands, namely, the body very much contracted and lying on the left side. The stone circles varied in size from 10 ft. to 45 ft. in

diameter. Another remarkable feature was the number of stones with indentations of cup shape, such as are found in Scotland and Ireland. In one place a stone was pitted in this way all over, and the Bedonins said that it had in very ancient days been set up as a boundary mark. On the settlement of a dispute, also, a member of each family of the two adjoining tribes made a hole in the stone. There was no fixing the date of these stones nor of the beehive houses; they might have been of the time of the children of Israel, or even of an earlier date.

STAMPS ON BUILDING LEASES.

THE difficulties caused by the view taken by the Commissioner of Stamps, as first pointed out in our pages, were brought before the House of Commons last week, and the Government were pressed on all sides to pass a Bill of Indemnity, and to remove the statute which calls for a 35s. stamp on building and other leases.

Mr. Alderman Lawrence rightly said the subject must not be considered as a question of stamp duty merely, but whether it was right that faith in the securities of the country should be shaken. Until the matter was settled dealings in those deeds would be brought to a perfect standstill. At present, as the deeds represented property, they were dealt in every day, and money was lent on them. The Chancellor of the Exchequer had not stated with sufficient clearness that the promised Bill should be brought in immediately, in order that the cloud which was hanging over property should be cleared away at once. As things stood at present, insurance offices that had leases brought before them in order to have money advanced on their security, would feel a difficulty in dealing with them. If the right hon. gentleman reviewed the whole question, he would see that it was of the utmost consequence that he should not insist on treating leases taken out within the four years in an exceptional manner.

Ultimately the Chancellor of the Exchequer undertook to bring in a Bill without delay. The importance of the subject is very great.

WATER SUPPLY AND THE HOME OFFICE.

WE understand, that owing to the default of the town council of Sudbury, Suffolk, in providing for an efficient water-supply, as required by an order from the Home Office, under the Sanitary Act, 1866, the Secretary of State, in pursuance of the further powers granted by the Act, will, through the Local Government Act Office, execute the necessary works at the cost of the town, and has appointed Mr. T. Hennell, C.E., of Salisbury-street, Adelphi, engineer for that purpose.

The present case possesses some interest from being one of the first where the extreme powers given by the Act have been called into operation.

SEWAGE AND THE LAND.

IN the course of the discussion which followed the reading, by Mr. W. Hope, at the Society of Arts, of a paper, "On the Use and Abuse of Town Sewage,"

Mr. R. Rawlinson, C.B., said be believed the most difficult land to irrigate would be a large area of comparatively flat land. He believed the most favourable was that having a limited contour elevation, and he should not even object to rather steep gradients in some instances, provided that the sewage at the commencement was sufficient for gravity, even if they had to go to some expense for pumping. His reason was this, that in irrigating land having a considerable fall, the engineer could pass his sewage by contour grips and lines over the upper areas, could then get it over the intervening portions into a second line of carriers, and as it was almost impossible to take out all the fertilizing qualities of sewage by once passing it over and through any table-land area, he could pass it over twice, thrice, or even four times beneficially, and he could then discharge the water from the last carriers as pure as ordinary spring water. He did not say they would ever arrive at that pitch of perfection when it would be safe to recommend the clarified water from subsoil drains for culinary and drinking purposes, although he knew at that moment of an instance in which the strongest sewage he ever heard or knew of was used by the adjoining residents in this way as it flowed from the subsoil drains, and that was at the farm at Aldershott; and as this was the most perfect system of sewage irrigation that had come under his observation, a word or two in description of it might be allowed. It was perfect in every respect, not only because the difficulties overcome were the greatest, and the sewage by far the strongest, but because the results were by far the best. The Aldershott Camp Sewage Farm consisted of about 98 acres of land, which was, as an old north country farmer once said, worth "nowt" an acre. It was absolutely worthless, consisting of 90 per cent. of sand, with a mixture of peroxide of iron, which was absolutely poisonous. Mr. Blackburn, the engineer who had charge of the works, and who, fortunately, had had some experience in agriculture, broke up the subsoil, washed out the peroxide of iron, drained it, and laid it under a sewage irrigation of from 200,000 to 400,000 gallons per day, the sewage coming from the camp, and containing 20 grains of ammonia in the gallon; and an analysis showed that, while it had 20 grains of strong phosphoric acid to the gallon as it flowed on the land, the water from the subsoil drains only had half a grain. Mr. Blackburn said it was of no use to irrigate land with sewage on the surface, or to plough it in the ordinary way; he invented a plough for the special purpose, and broke up the subsoil to a depth of 20 in., and having irrigated that well with sewage, he got a crop of Italian rye grass of from 70 to 80 tons to the acre. After two years he laid down a breadth in potatoes, which he sold on the ground at 25*l.* per acre, the purchaser being at the cost of digging and taking them away, and leaving the tops behind as a solid dressing for the land of considerable value. In the same autumn the land was broken up, prepared and sown with Italian rye grass, which he himself saw showing 2 in. above the surface. If, however, a good profit was to be made out of land irrigated with sewage in the vicinity of a town, it should be made to produce every kind of garden produce used in the community, all kinds of grain crops being avoided, as entailing only waste of labour, land, and money. Italian rye grass, mangolds, potatoes, cabbages, French beans, and lettuces, could all be grown with advantage, but they required special knowledge and special care; for some must not be irrigated at all while the crop was in the ground, whilst others required quite a different treatment. In this way as much as from 100*l.* to 200*l.* per acre of gross receipts might be obtained, for he had seen a return made by persons on whom he could place implicit confidence, showing with a crop of cabbages and cabbage-plants a gross return equal to 200*l.* per acre. Between this and the ordinary produce of 5*l.* to 10*l.* per acre was a wide margin, quite sufficient to induce efforts in this direction. They were on the threshold of this question, and only just beginning to understand it; and as there had been so much joint-stock enterprise of late, he would suggest to any gentlemen who wished to make their fortunes that they could not do better than form an honest company and go to some of the distressed towns which had been described as in the clutches of the Vice-Chancellor, and treat with them for their sewage and the land necessary to utilize it. He knew many towns which would receive them with open arms, and let them have the land at a fair agricultural price, and let them have the sewage in for nothing; and if there was any truth in chemistry, this could hardly be a bad bargain. But, at the same time, it must be conducted with knowledge and care, for he himself was concerned in a speculation of that kind where both the sewage and the land were as good as any in England, and the climate propitious, but, owing to defective management in some way, they only got a dividend of 1½ per cent., whereas, by letting it in the ordinary way, having bought it on good terms, they could have realized 5 per cent. There were, therefore, two sides to the sewage shield, as to most others; but he believed, nevertheless, that in the proper application of this system there was a mine of wealth, by bringing common sense to bear, and avoiding blunders which had already been committed. On the other hand, in many places it had become a sheer necessity to do something of this sort, in order to avoid poisoning the rivers, and would be more and more so every day. Before sitting down, he would say that the man who could solidify sewage and make it a portable manure, could invent perpetual motion and square the circle. The most perfect chemical researches had yet failed to do more than take out one-seventh of the valuable properties of sewage in solid form; and taking a ton of sewage as being worth 17s. 6d., and treating it in any possible way—and he spoke from having been associated on the commission with some of the first chemists of the day—the result would be to take out solid matter to the value of 2s. 2d., and leave 15s. 4d. worth to go away with the effluent water, which might nevertheless appear perfectly pure and bright. On the other hand, when liquid sewage was passed through twenty inches of soil, it had but the barest trace of these valuable salts left in it. This, therefore, was the only true and profitable chemistry.

THE FALL IN LIVERPOOL.

IF we may judge from the report in the local papers of an inquest recently held, as to the fall of a warehouse in Matthew-street, Liverpool, the corporation of that town would seem to possess in one of their building surveyors, Mr. T. Hunter, a remarkably acute purveyor of practical professional evidence on such cases. After stating that "the strength of the floors depended upon longitudinal beams running nearly down the centre of the buildings," and that the beams "were not in the centre throughout, as the warehouse had been built on an irregular piece of ground," we find the comment a little further on that "a longitudinal beam would be stronger if exactly in the centre than if it were out of it;" which is, to put the best face on it, a very odd way of expressing what we must suppose the witness intended to convey, that the bearing of the joists would be more even; but is not so surprising as the statement that "it was usual to weight a building *to half its bearing power*." If this is usual in Liverpool, we do not wonder that Liverpool warehouses fall down. After stating that the longitudinal beams referred to were "supported by iron columns, 9 ft. apart from centre to centre," we find afterwards that "each floor *bears its own weight* in the building." Then on what did the feet of the iron columns rest, on all but the basement story? Did they bear their own weight, too?

BUILDERS AND WORKMEN.

SIR,—One of your correspondents on the condition of the building trade says,—"We have miles of unoccupied houses in the suburban districts of the metropolis. The workman is asked to submit to a reduction of 12½ per cent. in his wages. Is the builder prepared to submit to a corresponding reduction in the price of the houses he has already finished?"

In asking this question, your correspondent has either overlooked the fact, or is unacquainted with it, that house property has depreciated at least 30 per cent. in value in many of the suburban districts during the last four years, and not only will the builder have to submit to this deduction on property already completed, but all the property he is compelled to erect by the terms of his agreement with his ground landlord, whatever be its cost, can only now be disposed of at the same rate. Where, then, is the "queer bit of legerdemain" by which 12½ per cent. will be transferred to the profits of the capitalist? T. H. A.

LEATHERHEAD.

I HAVE read with interest your description of Dorking, and concur in the remarks of your correspondent. From a pretty intimate knowledge of the place, I incline to think Dorking will improve but slowly. It lies in a valley, hedged in by beautiful scenery, but possessing scarcely any view of it. Persons will not come and settle in Dorking whom business does not draw there, and there are no manufactures or building operations in the immediate neighbourhood greatly to increase the trade of Dorking.

Not so Leatherhead, which is separated from Dorking by five miles of the prettiest country in England. The village of Leatherhead (it scarce deserves the name of town) is placed in the most picturesque situation, straggling up from the river Mole to the district recently laid out for building, and known as Highland Park. Lovelier views than are commanded from the latter England cannot supply, while the salubrity of the air is such that invalids in the neighbouring lowlands are prescribed a daily walk on this breezy down. Leatherhead is,

however, behind Dorking in sanitary arrangements, for it has not only no scheme of drainage, but no water except from wells dug down at great depths into the chalk. In the lower part of the village water can be obtained at 15 ft., at Highland Park only at 200 ft. This is, however, proposed to be remedied by the establishment of waterworks. As for the drainage, there is a natural fall to the Mole for the overflow, and the solid sewage is collected in cesspools. At some new houses at Highland Park Moule's earth-closet is in use.

Of all places within twenty miles of London Leatherhead is, in my opinion, the most improving; and the extraordinary rise in the price of land, which not long ago sold at the rate of 50*l.* an acre, and indeed under, while it now commands 500*l.*, attests the increasing attention of capitalits to this hitherto primitive but most charming locality. But what are we to say to no drainage—no water! It is all very well for the houses in the Park, that drain away naturally down the town, and can draw their water from deep wells undefiled; but it is time the Leatherhead folks bestirred themselves in earnest to prevent a general pestilence. A.

TENDERS FOR THE DRAINAGE WORKS, BRIGHTON.

THE Works Committee have just issued a report, submitting the following tenders for the construction of main and branch sewers in the western and northern districts of the borough, in accordance with the plans and specification prepared by the borough surveyor and approved of by the council:—

John Kirk, Woolwich	£39,696	0	0
F. W. Keeble, London	35,000	0	0
G. & R. Sawyer, London	34,951	0	0
Dickenson & Oliver, London	33,890	0	0
John R. Ivery, Fareham	30,500	0	0
John T. Chappell, Steyning	30,200	0	0
William Webster, London	29,900	0	0
W. & J. Pickering, London	29,602	1	6
William Crockett, London	29,000	0	0
W. Wigmore, Fulham	27,150	0	0
John Blackmore, New Wandsworth	25,844	0	0
Samuel B. Moore, Bedford	25,486	0	0
Thomas Morris, London	25,400	0	0
John Nicholson, London	24,950	0	0
Neave & Fry, Portsmouth	24,827	0	0
Cheesman & Co., Brighton	24,600	0	0
James Bloomfield, Tottenham	24,553	0	0
J. Phillips, London	22,978	0	0

The Committee recommend that Mr. J. Phillips's tender to perform the works for the sum of 22,978*l.* be accepted, subject to the approval of his sureties.

DESTRUCTION OF ST. JOHN'S CHURCH, BETHNAL GREEN.

SIR,—The report in your paper of last Saturday upon this subject will lead the public to suppose that the deficiency in the supply of water at the commencement of the fire was owing to some fault in the arrangements of the water company.

This was not the case: the turncock was in attendance, and an abundant supply of water ready before the arrival of the first engine, as testified by the churchwarden, Mr. Edwin Ward, by letter addressed to the company's inspector; but the hose brought by the engine was not of sufficient length to convey the water to the fire.

Upon the arrival of the second engine, the two lengths of hose were joined, and by this means the water was brought to bear upon the fire.

E. BATES, Secretary,
East London Waterworks Company.

LEGISLATION CONCERNING TRADE UNIONS.

THE following resolutions have been passed by the Committee on Labour and Capital, nominated by the National Association for the Promotion of Social Science:—

1. That the committee are of opinion that the right principle of legislation in all matters relating to trade unions is one of complete neutrality; neither subjecting such associations to special disabilities (such as withholding redress for embezzlement of their funds), nor granting them special privileges.

2. That both masters and workmen ought to be allowed to combine for the purpose of settling on what terms they will consent to employ or be employed; and, generally, that, so long as the objects in view are not criminal, all persons, of every class, should be free to unite: and to do so not only in separate bodies, but in confederation.

3. That while themselves free, trade-unions and all similar associations should, like individuals, be compelled, in turn, to respect the freedom of others; and that when this freedom is violated, certain, swift, and adequate punishment should be inflicted, so as to prevent any repetition thereof.

4. That while the committee hold that all attempts to force up wages beyond the market rate, or to prevent the use of machinery, or to exclude piece-work, or to limit the number of apprentices, or to exclude female labour, are not only contrary to justice, but arise from ignorance of economic science and from a wrong view of the interests of those who make them, they are of opinion that so long as such attempts are confined to argument and persuasion, or even to a refusal to work with those whom it is tried to influence, they should not be forbidden by law; but that when threats of molestation are employed, and, still more, actual violence, the law should instantly afford its protection to the sufferers and punish the offenders.

5. That the many instances in which terror and maltreatment have been used, in attempts to coerce, not only employers, but fellow work-people—and the latter, indeed, in an especial degree—as, for example, in the late lamentably disgraceful riots near Sheffield, show that the present means of preventing such outrages are lamentably insufficient; and that as respects either the criminal law or its administration, or both, there are great defects.

6. That whenever it can be shown, to the satisfaction of a jury, that any one has been wronged, either in his person, earnings, or property, through the instrumentality of a trade-union or of any other association, the funds of such association should be liable for indemnification; and that in all cases the means of obtaining the redress should be ready and inexpensive.

7. That the committee heartily agree with the Trade-union Commissioners in the great value they attach to Boards of Conciliation, as organised by Mr. Mundella; and in their opinion that it is essential, for the good working of these Boards, that they should be what their name implies, and not be armed with legal powers.

EDWIN PEARS, General Secretary.

February 7th.

WANTED, A SCHOOL OF ARCHITECTURE.

SIR,—Can any of your readers inform me, through your columns, of a "School of Architecture" in London, where a young gentleman (somewhat advanced in free-hand and architectural drawing) could study and receive instruction in the *principles* of architecture?

He would require to study from *casts* and diagrams of the best examples, the orders of Grecian and Roman architecture, and also of the Norman and Gothic, &c., according to their several periods; to hand-sketch accurately, and to measure and lay the whole down on paper to scale, and shade and colour them correctly, so that previously to entering an architect's office, or studying on the works, construction, and practice, he might be a good freehand and geometrical draughtsman and colourist, and have a good knowledge of the theory of architecture generally.

STUDENT.

*** We apprehend that the classes about to be opened at the Museum of Architecture will best meet our correspondent's wants.

COMPENSATION QUESTIONS.

Sir Robert Peel, Bart., v. *The Metropolitan Board of Works.*

THIS was an action in the Court of Exchequer to recover 5,355*l.*, under an award made by an umpire to whom the plaintiff's claim for compensation for injury done to his residence in Whitehall-gardens by the Thames Embankment Works had been referred, as well as 258*l.*, the costs of the award.

The house was No. 4, Whitehall-gardens, and was erected in 1824 by Sir Robert Smirke for the late Sir Robert Peel, on a part of the site of the Palace of Charles I. In that year the Crown granted a lease of the ground to Sir Robert Peel for ninety-nine years, and it contained a covenant that he should construct upon it a building which should cost not less than 14,000*l.* At the rear of the house there was a large garden running down to the Thames, with a dwarf wall at the end, and a gateway and steps leading to the foreshore. In 1862 the defendants obtained an Act of Parliament for the formation of the Embankment, and during the progress of the works the plaintiff was exposed to great annoyance in his occupancy of the house from the noise, vibration, dust, and other disturbing causes. In consequence also of the continual pumping there was a subsidence of the foundation, and cracks were observed in the walls and ceilings. On the 13th December, 1867, the plaintiff sent in a claim to the defendants for 7,500*l.*, and being disputed, the matter was referred to two arbitrators, one being appointed by each side. They were not able to agree; and Mr. H. Matthews, Q.C., being called in as umpire, he, on the 29th June last, made his award, giving the plaintiff 2,000*l.* in respect of the occupancy being depreciated by the execution of the work, and 3,355*l.* for permanent depreciation in the value of the house from the subsidence, and from the landing steps, with free and direct access to the river, being destroyed. Formerly the steps were used for landing coals, furniture, and other articles required in the house, as well as for taking pleasure-boats.

Mr. Baron Bramwell asked whether an action at common law would lie for the subsidence of a foundation caused by the abstraction of water from adjoining land.

Mr. Williams thought it would, if there had been an occupation for twenty years.

Mr. Baron Bramwell.—A man has a right to withdraw water from his own land, and it has been held in a well-known case that where a well had been destroyed by a neighbour digging a deeper well he was not liable. There was no easement in subterranean and unseen water.

Mr. Williams said the subsidence was caused not only by the withdrawal of water, but also by the vibration resulting from constant pile-driving.

Evidence having been given for the plaintiff,

Mr. Baron Bramwell, in summing up, said the case was undoubtedly one of great embarrassment, but the questions of fact were very simple. First, were the vibration, noise, and dust, a substantial grievance? Secondly, if they were, was that grievance or nuisance the result of a proper or improper way of doing the work? If the result of an improper way, the plaintiff's remedy would be by another action against the defendants or their contractor. Thirdly, did the umpire include in the sum he awarded for temporary damage anything for the annoyance caused by so many workmen being on the spot? If he did, that would not be the subject of an action. Under the head of permanent damage, he asked the jury whether the plaintiff sustained any damage by the loss of access to the river *per se*; and next, if he had, whether it was compensated for by the substitution of the embankment. He also asked whether there was any structural damage to the house, and if so whether it was the result of the defendant's works, and further whether the umpire had given anything for loss of view, or what were called the amenities of the residence.

The jury, after having retired, answered all the questions with regard to the temporary damage in favour of the plaintiff. With respect to the permanent damage, they said there was damage by cutting off the access to the river, but, taking into account what had been substituted for it, there was no such damage. They also found there was structural damage of money value caused by the defendant's works, and that the umpire had given something for loss of amenities. They also answered several other questions which had been put to them by the learned judge.

Mr. Baron Bramwell directed a verdict to be entered for the amount claimed with interest, giving the defendants leave to move the court above on points of law.

ISLE OF MAN PUBLIC OFFICES COMPETITION.

WE have more than once referred to this competition, especially with reference to the stand made against the decision by Mr. Ellison, one of the competitors, and the support his view appears to have received in the island. The question last week again came up, and the Tynwald Court, by 17 votes to 4, rejected all the drawings, including those to which the committee had awarded prizes; so throwing away the amount spent on premiums, and the labour of the last twelve months. As it is more than probable that another competition will be asked for, it is right the profession should know how some of its members have been treated in the matter.

BUILDERS' CLERKS' BENEVOLENT INSTITUTION.

THE third annual general meeting of the donors and subscribers, to receive the report and balance-sheet for the past year, to elect the officers for the ensuing year, and to consider sundry propositions for alteration of the rules, was held at the offices of the Institution, Bedford-row, on Thursday, the 24th ult.

The report showed that within the period of the three years of its existence the Institution has had five pensioners depending upon it, in addition to the sums expended in grants for temporary relief.

Mr. Thomas Stirling has consented to accept the office of president for the present year.

The Chairman (Mr. Thomas Stirling), in moving the adoption of the report and balance-sheet, gave a brief account of the rise and progress of the Institution. The collections to the end of last year amounted to about 1,190*l.*; expenditure, 290*l.*; pensions and relief, 80*l.*; invested 750*l.* Five pensioners had been elected, and there were at the present time applications from three more candidates, one (an especially distressing case) being a clerk, totally helpless, from paralysis and softening of the brain, having a wife and four young children, three of whom were ill with the measles. Most likely an election of pensioners would soon be held; in the meantime the committee had already granted this year 20*l.* as temporary relief.

FROM AMERICA.

AMERICAN newspapers give us a few items that interest or amuse. One says,—Mr. Thomas Kennard demands of Mr. James McHenry, in the courts of Cleveland, Ohio, the modest little sum of 1,128,609·19 dolls., as damages, the claim being founded on an account for services rendered as civil engineer since April 1, 1866, on the Atlantic and Great Western, Buffalo Extension, Western Central, Morris and Essex, and Catawissa railroads, and the International Bridge. —— An Englishman named Ringrove, lately died in New York, worth 150,000 dolls. He was a carpenter by trade, and by shrewd investments accumulated the above sum, living to the age of eighty-five, in the most abject manner.——Mr. F. D. Robinson, of North Haven, Conn., has invented an apparatus for dropping feed to horses, cattle, and poultry, in the absence of the attendant. It consists of a hopper with a lid at the bottom, which is made to drop at any time desired by a small clock, working on the principle of the alarm clock. If the farmer wishes his cattle or horses fed at an early hour, before he gets out of bed, or at any time during his absence, he has only to fill the hopper and set the clock, and the machine does the work at the appointed time.——Then comes a new version of the goose and golden eggs. Five geese expired suddenly on Mormon Island among the gold mines. The owner examined the entrails and found auspicious augury. The fowls had been feeding near an old claim, and were poisoned by amalgam. Forthwith their mortal remains were panned out, and yielded precious metal from 2·50 dolls. to 5 dolls. apiece. Immediately the miners went wild. A fury that spared neither age nor sex, ripping up elderly ganders, and tearing out the gizzards of green goslings, was exhibited. The cries

of the web-footed rent the air; their blood dyed the Sacramento river.——In California, the other day, a number of shoemakers, being told that their wages must be reduced, struck; but not desiring to remain idle and eat up all their savings, and finding that there was no work to be had in the shops, they held a meeting, organised a co-operative society, raised funds, and immediately rented rooms, purchased stock, and commenced work for themselves, and in a very short time, it is said, will be able to give employment to persons who are not stockholders in the society.

FROM IRELAND.

Dublin.—An application is being made, it appears, to the Attorney-General, to grant a patent for a new theatre. The promoters of the enterprise are the Messrs. Gunn, music publishers. As they intend their theatre to be specially devoted to operettas, vaudevilles, and light comedies,—a class of dramatic entertainment rarely presented on the Dublin stage,—they will not interfere with any existing interest. A small, comfortably appointed, and well-conducted house, in which light and sparkling pieces will be presented by cultivated artists, has long been a desideratum in Dublin. The site chosen for the new theatre is in Grafton-street.

Ballymena.—Sir Shafto Adair, who owns a large estate in and near Ballymena, and who has always shown great interest in the improvement of his property, has presented to the inhabitants of Ballymena a "People's Park" of fifty-five acres. Sir Shafto further proposes to inclose and ornament the park, at an estimated cost of 1,500*l.*

LONDON, 1869.

ACCORDING to the Registrar-General's report it appears that the rate of mortality per 1,000 for the past year was 24·66; that of males being 27·01, and that of females 22·61. The population is estimated at 3,170,754, consisting of males 1,478,840, and females 1,691,914. The number of deaths was 77,933, consisting of males 39,812, and females 38,121. The number of births was 111,930, or 56,876 males, and 55,054 females. The population was increasing annually between 1851 and 1861, at the rate of 1·73 per 1,000. Scarlet fever, whooping cough, and diarrhœa were the reigning epidemics of the year; and to them 12,958 deaths were due. "Howard's devotion to the criminal population," remarks the Registrar, "rescued them from the hands of fever, and our prisons are now models, which only excite regret that their favourable sanitary conditions cannot be placed within the reach of honest labourers." The average mortality for thirty years of the five regions of London ranges from twenty-three in the north and twenty-three in the west, to twenty-five in the south, twenty-five in the central, to twenty-six in the east districts. In the year 1869 the mortality exceeded these averages everywhere except in the west districts and South London, where the effects of drainage are manifest. The mortality was at the rate of 28 per 1,000 in the east districts.

SCHOOL-BUILDING NEWS.

Manchester.—The Fallowfield new schools have been inaugurated. The schools are located on a site in Portland-grove, and form an unpretentious building, the style of which is, in the main features, Gothic. The interior measurements of the schoolroom are 55 ft. by 28 ft. The ground-floor is divided into six class-rooms, of which the two central rooms, one on each side of the main corridor, are the larger, being 21 ft. by 16 ft., and the others respectively 18 ft. 6 in. by 12 ft. and 16 ft. by 9 ft. A partition divides the upper floor into two large schoolrooms, with separate entrances, one for boys and the other for girls; but the partition will be easily removable, so as to convert the floor into a hall, occupying the full extent of the building. It is estimated that good accommodation will be provided in the schools for 300 scholars. The architect is Mr. Ernest Bates, and the cost of the building is said to be about 1,000*l.*

Chelsea.—A new schoolroom has been erected in Cadogan-terrace for the Belgrave Presbyterian Church Schools, and has been opened by public meetings. The buildings occupy a site over the Metropolitan District Railway, and provide, on the ground floor, in the rear, a schoolroom, 43 ft. by 27 ft. by 25 ft. high, with a gallery at one end for the convenience of the elder scholars and infants, whose class-rooms are on the first floor in the front building. It has an open roof, with iron ties, struts, &c., and a large lantern in the centre, by means of which effectual light and ventilation are obtained. At the platform end of the room the angles are cut off to provide the necessary W.C. and other accommodation, and also to secure uninterrupted light over the same for this end of the room. In the front building, which faces the street, two class-rooms for elder scholars, and one for infants, are provided; also sitting and bed rooms for the attendants, a kitchen, and coal-cellar. There is a stone staircase to the upper rooms, and beneath the same a librarian's closet. The front is faced with white Suffolk bricks, with red arches, cornices, &c., into which black bricks are occasionally introduced; and an inscription in tiles bearing the name of the school is to be placed under the first cornice. All the internal woodwork is stained and varnished, and the walls of the schoolroom are covered with Portland cement. The whole has been carried out at an outlay of about 1,250*l.*, by Messrs. Scrivener & White, under the superintendence of Mr. T. Heygate Vernon, whose design was selected in a limited competition.

Coley, Reading.—A new school building has been opened here. It contains accommodation for 400 children. The estimated cost of the building was about 600*l.*, exclusive of site (old St. Mary's workhouse) 300*l.* Mr. Smith, of Reading, was the architect; and the contractor was Mr. Simmonds, also of Reading.

PROVINCIAL NEWS.

Nantwich.—The foundation-stone of some new almshouses at Nantwich has been laid by Miss Tollemache. The site is at Welsh Row Head. The builder is Mr. James Parker, of Beeston. The six old houses were so many hovels, only consisting of one room each, as a dwelling for all purposes. They were built and endowed by Mr. Tollemache's ancestors, the Wilbrahams of Woodhey Hall, about 200 years ago. The new cottages, six in number, will consist of a lower floor, and a second story, having two sleeping-rooms, 14 ft. by 10 ft., and 10 ft. by 8 ft. On the bottom floor there will be a house-place, measuring 12½ ft. by 14 ft., a chamber 8 ft. by 8 ft., a pantry 7 ft. by 6 ft., and outbuildings.

Talgarth.—Recently two or three meetings have been held at the magistrates' room, the vicar presiding, to consider the propriety of erecting a new market-house, the present one being too small, inconvenient, and in a dilapidated condition. The scheme has been talked of for some time past, but, owing to the difficulty of procuring a suitable site, nothing could be done. This difficulty has at last been surmounted by the gift of Lord Ashburnham of a suitable situation in the centre of the town. Mr. R. Davies has received orders to prepare plans for the building, which is to be 47 ft. long by 27 ft. wide, with a spacious room over it, to be used for concerts and other public meetings. The scheme is proposed to be carried out by a company, with 250 2*l.* shares. The town has been improved of late.

Books Received.

"THE Appropriation of the Railways by the State. By A. J. Williams, Barrister. Cassell, Petter, & Galpin." This is a people's cheap edition of Mr. Williams's proposals for the conversion of the railways into really public highways. ——"The Railway, Banking, Mining, Insurance, and Commercial Almanac for 1870. Edited by W. P. Smith. Simpkin, Marshall, & Co." This is much more of an annual review of the material interests of the United Kingdom,—as, indeed, a sub-title calls it,—than a mere almanac. It gives a variety of information useful to the merchant, manufacturer, and the general public, with notices of coal, iron, metal, cotton, &c. The book contains reviews of some length of the progress and building societies; metropolitan expansion and social and sanitary requirements; railways; the iron trade; trade and finance of 1869, &c.——"The Animal Kingdom: an Elementary Text-book in Zoology. By Ellis A. Davidson. With illustrations. Cassell, Petter, & Galpin." This little volume is specially classified and arranged for the use of science classes, schools, and colleges. It makes an interesting little volume, and is well illustrated by engravings.

Miscellanea.

Glasgow University Buildings. — It is expected that, although not perhaps finished in all respects, the new buildings will be ready for occupation by November. The university has frontages to the north, the south, and the east, with, at the west end, a row of professors' houses. In the centre is a spacious quadrangle, divided into equal parts by the great hall, running from north to south. The foundations of the great hall have been laid, but the superstructure yet remains to be erected. The main front of the university is to the south, with, in the centre, a tower, which is to rise to a height of 300 ft. from the ground-line. Externally this front is completed, with the exception of the tower, which has only reached the ridge of the central wing. Four shafts will be led from the top of the central tower, down which the air will be drawn to a capacious air-tube running underneath the quadrangle. At the mouth of this subterranean passage is a large fan, which will serve the double purpose of sucking the fresh air from the top of the tower, and passing it into the tube at the bottom. Along the air-passage are a series of openings leading into chambers furnished with metal pipes, and communicating with the apartments above; and, by means of boilers which are fitted up in various parts of the building, these metal pipes in cold weather will be supplied with a constant stream of hot water. In all, thirteen self-contained dwellings have been provided, but this is only half the number of professors connected with the university. The contractor for the buildings is Mr. John Thomson. Professor G. G. Scott, our readers will remember, is the architect.

Society for the Encouragement of the Fine Arts.—On the 24th ult. there was an exhibition of paintings of James Ward, R.A., including the celebrated "Mill," painted in 1806 in emulation of a similar picture by Rembrandt. Mr. G. R. Ward occupied the chair, and there was a very large attendance of artists and others interested in art to do honour to the occasion. Mr. S. C. Hall opened the proceedings with an able address, in which, after paying a graceful compliment to the different members of the family present,—all of them distinguished artists,—and some brief allusions to his first acquaintance with James Ward, R.A., he declared that for truth, force, and accuracy, and the faithful delineation of animal life, no British artist before or since had surpassed him, one or two of his works being rivalled only by those of Paul Potter, added to which he was eminently skilled in landscape painting. Mr. G. R. Ward said his father obtained his first reputation as an engraver, his Cornelius, after Rembrandt, having been pronounced by a competent authority the finest work in mezzotint ever produced in England, but that in order to become a Royal Academician he gave up engraving, his first important work being the horse Adonis (belonging to George III.) attacked by a boa-constrictor,—a painting rejected by the Royal Academy, but which made the fortune of its exhibitor in America.

Sewer Ventilation.—Mr. John Kennett has been lecturing at Eastbourne on this subject, with reference to a patented invention of his own,—a modification of the furnace principle, in which the town lamp-posts and lamps are made use of, one half as upcast shafts and the other as downcast shafts. "In the upcast the burning of the coal-gas in the lamp creates a vacuum at the point of combustion, consequently the air from the sewer is immediately drawn into the light and becomes decomposed, and supposing that the lamp draws no more air from the sewer than is necessary for the support of combustion, then the whole of the sewer gases pass through the light; or in case the heat force draws more air than can be consumed, then the whole being warmed from 30° to 50° by the burning gas, or from 20° to 30° by the radiant heat of the sun (which is absorbed by the glass lantern) above that of the external atmosphere, the molecular condition of the air is altered, being dried, dilated, and then forced upwards without creating a nuisance. The heat is transmuted into work," and "the current of the main body of the sewer air is diverted from the dwellings."

The Grand Stand Accident at Cheltenham.—After three years' tedious litigation, a judicial decision has at length been given in the case of Francis *v.* Cockrell, the question at issue in which was the liability or otherwise of the defendant, as a member of the race committee, for the damages sustained by the plaintiff, who was one of those injured by the fall of the grand stand at Cheltenham races in 1867. As this case might to some extent be taken as governing others, it has been closely fought. Originally, it stood for hearing at the Gloucester Midsummer Assize following the accident, but on its being called on a reference was made by consent to Mr. J. O. Griffits to find as to facts. Several months elapsed before the special case was drawn up, and it was not until last July, more than two years after the mishap, that it came on for argument in the Court of Queen's Bench. Judgment was then reserved, and after another six months' delay the decision of the Court was delivered on Monday, the Lord Chief Justice, Justice Mellor, Justice Lush, and Justice Hannen sitting in Banco. Justice Hannen delivered the judgment, in which he reviewed a number of cases bearing on the issue. The result was that the authorities appeared to be in favour of the plaintiff, on the ground that a person entering into an implied contract for safety was not exonerated simply because he had employed a competent builder. Judgment was therefore pronounced for the plaintiff.

The Equalisation of the Poor Rates.—Mr. Goschen's Bill in the House of Commons proposes to place half the expenditure of the metropolis for poor relief on the Common Fund. That is, the half of 1,400,000*l.* This is a great step towards an equitable distribution of the cost of the metropolitan poor on the ratepayers. A grant of 3s. 6d. per week for each inmate is to be allowed out of the Common Fund. To that fund fifteen parishes contribute, and twenty-four draw upon it. Medical officers, relieving officers, and paid nurses will be increased in number, but nothing will be done to assist out-door relief from the Common Fund. To prevent guardians giving as much relief as possible within the workhouses, a limit will be placed upon the number. The proposal demands the earnest attention of the metropolitan members. At the last meeting of the Marylebone board of guardians notices of motion were given by Mr. H. C. Tucker, amongst others, as to the 3s. 6d.:—

"That it will be a great cruelty and hardship to the most respectable poor, to whom alone the house is a test, by breaking up their homes, and destroying the remains of self-respect, and leaving those who decline to enter the house to die of slow starvation. That recent improvements in dietary, ventilation, warming, and general comfort in workhouses render them no longer a test and terror to the worthless; and that if any allowance be given from the common fund, it should be given impartially to every adult, whether in receipt of in-door or out-door relief."

Surely this is a retrograde step of Mr. Goschen's. The time is past for adding to the hardships of the deserving poor, by forcing them into the workhouse, and sustaining it as a terror to the worthy rather than to the worthless, as he proposes to do.

Explorations in Palestine. — Captain Warren has recently been conducting explorations at the following points:—The district of Coelo, Syria, has many important ruins of temples, which have nearly all their entrances towards the east; and their positions are similar to the temple of Jerusalem; and the ruins of the synagogues in Galilee have many points of resemblance. There is one peculiarity about some of these temples which appears to distinguish them from those of Europe. They are mounted on stylobates, and have no steps or staircase up to the entrance, and the only method of entering is by a small door opening from the side of the stylobate into the vaults underneath, and thence by some means into the temple itself; from this it would appear either that only the priests went into the temple, or else that there was some temporary wooden staircase up into the stylobate. The small temples about Hermon appear to be somewhat of more ancient date than those in the Bukâ'a; they are of the Ionic order, and are *in antis*.

A New Opera House for Paris—Whenever there is a big house to let in Paris, it is sure to be turned into a theatre. The huge Magazins Réunis are about to meet their inevitable fate. M. Gueymard has obtained permission to cover over the court-yard, and to convert it into an opera-house, where the masses are to be initiated into the works of the great masters. —*Galignani*.

Value of Land in Liverpool.—At a recent sale of corporation property in Liverpool, a small office and about 162½ yards of leasehold land (corporation lease of 72 years), situate in the old churchyard, Chapel-street, sold for 3,360*l.*, being at the rate of 20*l.* 13s. 7d. per yard; and a block of 262 yards of unoccupied land in New-street, Victoria-street, realised 4,380*l.*, being at the rate of 16*l.* 14s. 4d. per yard.——An inquiry was held before Mr. J. J. Aston, Q.C., and a special jury, to assess the value of one front house, let at 8s. 6d. per week, and two court houses, at 3s. 9d. each per week. Mr. Hornblower, Mr. Peter Ellis, and Mr. Wordley were called for the claimant, Mrs. Bartlett, their valuations being respectively 586*l.*, 575*l.*, and 622*l.*, including 10 per cent. for compulsory purchase, and being calculated at about sixteen years' purchase on the net rental. Mr. Culshaw and Mr. Scott, who were called for the Corporation, considered that the rents were excessive, and that, after deducting 20 per cent. for outgoings, the net rents would not be more than 30*l.*, which they capitalised, one at thirteen years' purchase, and the other at twelve years' purchase. Mr. Culshaw's valuation, including the 10 per cent., was 429*l.*, Mr. Scott's being only 398*l.* The jury retired, and gave a verdict for 510*l.*

Official Expenditure in the Metropolitan Board of Works.—At the last weekly meeting of the Board, on bringing up the usual report of the Finance Committee, Mr. D. Rogers drew the attention of the Board to the very heavy charges which were being constantly made by the officers of the board for cab hire, and instanced one case where a cab was charged for from Spring-gardens to Charing-cross. Mr. Collinson also complained that officers sent out on their duties were in the habit of charging for refreshments, and spent the time that ought to be occupied in their duties in taking those refreshments, at the cost of the ratepayers. Mr. Richardson referred also to the charges made for coach hire for the Fire Brigade, and generally condemned the expenditure incurred beyond the ordinary expenses of the Brigade. After a long discussion, and an amendment that the report be referred back to the committee for further consideration, on a division the amendment was negatived by a majority of 17 to 13, and the report was adopted. Captain Shaw, chief officer of the Fire Brigade, sent a letter requesting an increase of his salary. The application was referred to the General Purposes Committee.

A New Cab Register.—A new vehicle register, which has been invented by M. O. Vivier, a French chronometer-maker, and is intended to put an end to overcharges by the drivers of hired vehicles, is described in the London *International* newspaper. The register occupies but a very small space; it may be fixed inside or outside the carriage. It has two distinct parts —one for the guidance of the proprietor of the cab, the other for that of the driver and the public. The part which is intended to guide the public consists of a couple of dials, always visible, one of which indicates the number of miles travelled, and the other the fractions or subdivisions of the last mile entered on. A spring can be pulled which instantly sends back the hands to zero. There is a self-acting arrangement by which, when the carriage is empty, the register ceases to act. But would not such a register be apt to tempt cabmen to prefer long routes to short ones, for the purpose of increasing their fares?

Tewkesbury Water Supply.—The Cheltenham Water Company having nearly completed their works for the supply of water to the inhabitants of Tewkesbury from the Severn, a public meeting, convened by the mayor, was held on Monday last, at the Town-hall, to arrange the terms on which the company should supply the water. Mr. McLansborough stated that the company's charges would be 5 per cent. on the gross estimated rental of houses over 10*l.*, with extra charges for closets, gardens, baths, and so on. After an animated discussion of upwards of two hours, this resolution was carried:—

"That unless the Waterworks Company consent to supply the town at 5 per cent. on the rateable value instead of on the gross estimated rental, it is the opinion of this meeting that the inhabitants should confine themselves to their present private supply for culinary and domestic purposes."

A second resolution was agreed on to the effect that the public should only pay for extras they really needed and used.

Salisbury Cathedral.—The report of Mr. G G. Scott, R.A., on the restoration of the choir of Salisbury Cathedral as a memorial to the late Bishop Hamilton, is published. He estimates that the works will cost 8,500*l.*, including the restoration of the stonework of the choir without the aisles or transepts, the screens and sedilia in the north and south-eastern bays with the tomb of Bishop Poore, the screens to the eastern transept arches, the restoration of the stalls and subsellæ with new desk-fronts to the same, the Bishop's throne, the new pavement and steps, with the probable amount of the architect's charges, and the salary of the clerk of the works. The reredos he supposes to be given. The grilles behind the same will, he thinks, cost about 450*l.*; the pulpit, 300*l.*; the organ screen, and remodelling of the organ, from 3,000*l.* to 3,500*l.*; the incidental expenses, 1,000*l.* The plans show that it is proposed to bring back the choir, with its arrangements and decorations, as nearly as circumstances will permit, to its original condition. He is in favour of opening out the choir to the nave, and considers an open screen a *sine qua non*.

Good Tunnelling.—A great underground work is the Ernst August Gallery—one of five belonging to a metal mine in the Hartz. "The mouth of it is at Gittelda, in Brunswick. It is 10 ft. high, 6½ ft. wide, and has a fall three-fifths of an inch in a yard. Like a railway tunnel (but it is twice the length of the longest), it was begun simultaneously at various different points, and finished in thirteen years. The gallery is 6¾ miles in direct length; but if its lateral branches are taken into account, and a subterranean gallery, navigable for boats, which opens into it, the Ernst August Galleries are said to be not less than fifteen miles long. All the junctions of the different sections fit accurately into each other, the precision of the results having been partly insured by the aid of a magnet, weighing 200 lbs., which influenced the compass through the solid rock 65 ft. deep, and which was kept in one of the working-places, while the compass was held in the other."

Working Men's Club and Institute Union.—The council of this society having always regarded the institution of discussion meetings at working men's clubs and institutes as an object of very great importance, both as a means of mental discipline and political education, and also as affording opportunities for persons of different occupations and positions in life to become better acquainted with each other's opinions and interests, propose to invite their members, as well as representative men of all classes and opinions, to meet from time to time at their office in the Strand for the discussion of questions in literature, sociology, politics, history, and ethics. A conference was held at the rooms of the Union, on Thursday, March 3rd, when the question discussed was,—"Is it expedient to substitute the Metric Decimal System of Weights and Measures for those now in use?"

Improvements in Locomotion. — Sir Joseph Whitworth, at a recent dinner of the Foremen Engineers, deprecated the use of horse tramways as unsuited to the times. He further intimated his opinion that "mechanical engineers have a right to enter their protest, considering the many obstructions there have been for many years past to the employment of road locomotives." Sir Joseph thinks it quite possible to produce a small, light, locomotive, which would work quietly and effectively for use on roads, but, as a preparatory condition, he recommends that the roads should be better made, and kept in a proper state of surface by the use of steam-rollers, steam-sweeping machines, and other appliances.

A Board of Conciliation and Arbitration for Liverpool.—The Liverpool operative leaders have held a preliminary meeting with the view of establishing a court of arbitration in Liverpool. The chairman of the trades' council presided, and the meeting was unanimously in favour of the object in view. A circular was agreed upon, inviting the co-operation of the employers. This circular has to be submitted to the trades' council.

Landscape Architecture.—In December last an advertisement appeared in the public papers, offering a premium of 30 guineas for the best plan for "Public Parks and Recreation Ground at Luton, in Bedfordshire." The premium has been awarded to Mr. J. H. Carrington, landscape architect, of Mile-end, near Stockport.

Instruction in Economic Science.—The Executive Committee, on Labour and Capital, of the National Association for the Promotion of Social Science have urged on the President of the Privy Council their strong conviction,—

"That the hostility between labour and capital, arising from an erroneous belief that the interests of workpeople and their employers, and of tenants and landlords, are opposed to each other—a belief leading, in manufactures, to attempts to impose harassing restrictions regarding rates of wages, hours of labour, piece-work, number of apprentices, and the use of machinery; and, in agriculture, to attempts to dictate the amount of rent to be exacted, and the selection of tenants; and leading, in its further stages, to strikes, locks-out, rattenings, and threats of personal violence, and ultimately, in many cases, to murder itself,—might have been mitigated, and in great measure prevented, had the people of this country in their youth, and before the mind could be warped, been instructed in the elements of economic science; and on this and on other grounds they respectfully urge that no more time be lost in taking measures for introducing this knowledge, as a regular branch of education, into all schools to which the State gives pecuniary aid."

New Cabs.—The London Depôt Carriage Company will, in a short time, offer to the public private carriages at the same rate as the existing cabs. These carriages will combine the convenience of the *voiture de remise* in Paris, with the comfort of a London brougham. There will be covered stands provided for them in all the principal thoroughfares, to each of which there will be an overseer or checktaker, who will be responsible for the civility of all the men under him. There will be 900 new carriages and 900 strong horses, at the cheap rate of 2s. 6d. the hour, or arrangements to be made for a whole or half a day.

Steam Boiler Explosions. — From the annual report of the chief engineer of the National Boiler Insurance Company, it appears that the boiler explosions reported during 1869 have been unusually numerous, and the fearful loss of life and number of persons injured thereby, much exceed the average recorded of late years. He had received information of no less than 60 explosions, by which 84 persons were killed and 142 seriously injured.—Total, 226. Out of the 60 explosions 23 were of plain cylindrical boilers, externally fired; and 14 of Cornish, or one flued, internally fired. The chief cause of the explosions were fracture at riveted seams, deficiency of water, and internal corrosion.

Sculpture.—We understand that at a meeting of the subscribers to the Gladstone statue, held in the Mayor's parlour at Liverpool recently, it was unanimously decided to offer the statue to the mayor and town council of that town, for the purpose of having it placed in St. George's Hall. The statue is the work of Mr. Adams Acton.——The bronze statue of the late Earl of Carlisle has, we understand, been completed by Mr. Foley, and is about to be erected in the People's Garden in the Phœnix Park, Dublin, a place in which his lordship took considerable interest.

Monumental.—A cross of granite has just been erected in Stoke Canon Churchyard, to the memory of the late Mr. Ralph Barnes, the secretary and legal adviser of the late Bishop of Exeter. This tribute of the affection of his children has been carried out by Messrs. Easton & Son, of Exeter. The cross is bold, and rests on massive steps of granite. The work is analogous in its design to one erected by the same sculptor over the remains of the late John Keble, the author of the "Christian Year."

Glass Manufacture.—At a recent meeting of the Paris Academy of Sciences, M. Fiel exhibited specimens of flint glass of great density (Faraday's glass), obtained by a new process, enabling masses of this material to be manufactured, weighing from 25 to 35 kilos., perfectly pure, homogeneous, and free from striæ, and of a density equal to and even greater than that of Faraday.

Smethwick.—The committee and members of the Smethwick and District Building Society met on Monday last for the purpose of appointing an architect and valuer. There were fifteen applicants for the appointment. Messrs. T. C. & J. P. Sharp, of Birmingham and Smethwick, were unanimously elected architects; and Mr. J. Howell, of Birmingham, valuer to the society.

Windsor Castle.—The occupants of the houses in the Horse-shoe Cloisters at Windsor Castle have received orders to vacate them as soon as possible, so that the work of restoration, in the timber and herring-bone brickwork style, which may now be seen in many parts of the building, may be commenced.

Her Majesty and Epping Forest.—In the House of Commons, on Tuesday evening last, Lord O. Fitzgerald, the Comptroller of the Household, brought up the reply of her Majesty to the address with regard to this forest, as follows:—"I have received your address, praying that I will take such measures as I may deem most expedient in order that Epping Forest may be preserved for the recreation and enjoyment of the people. Concurring with you in the desire that open spaces in the neighbourhood of the metropolis may be preserved for the enjoyment of my people, I will carefully consider how effect may be given to the prayer of this address."

Northern Architectural Association.—A special meeting of the members of the Northern Architectural Association was held on Saturday, the 26th ult., at the Old Castle, Newcastle-on-Tyne, for the purpose of taking into consideration and preparing a report upon the minutes and proceedings of the eighth annual meeting of the Architectural Alliance. After a lengthened discussion on the several subjects contained in the minutes, a report was adopted.

South Kensington Museum Model.—Mr. W. H. Gregory, in the Commons, asked the Secretary to the Treasury if he would place in the library the model of the buildings of South Kensington Museum and the explanation of the model. Mr. Stansfeld said the model was on a very large scale; but if a convenient place could be found for it in the library there was no objection to its being placed there.

Royal Horticultural Society. — Wednesday's exhibition of spring flowers included magnificent specimens of orchids, camellias, cyclamens, and primulas. The weather was so genial that a more than usually large number of members attended. There is every prospect that the hyacinth show on the 16th inst. will be one of great interest, as the foreign growers offer prizes to a considerable amount.

Protection of Iron.—*Nature* states that a method of protecting iron from atmospheric influences has been proposed by Messrs. Macmillan & Macgregor, of Dumbarton and Glasgow. They bring melted sulphur into contact with the cold metallic surface to be protected. The sulphur chills and sets into a hard, thin, protecting covering.

TENDERS.

For erecting St. Jude's Church, South Kensington. Messrs. George & Henry Godwin, architects. Quantities supplied by Messrs. Gardiner & Bell:—

		If second malms used internally in place of picked stocks, add
Fish	£13,200	£45
I'Anson, Brothers	12,978	141
Perry & Co.	12,590	43
Patman & Fotheringham	12,515	130
Colls & Son	12,475	130
Dove, Brothers	12,375	115
Scrivener & White	11,998	65
Nightingale	11,857	110
Manley & Rogers	11,840	65
Higgs	11,761	100
Browne & Robinson	11,515	62
Myers & Sons	11,300	141

For sewers, at Brighton. Mr. Philip C. Lockwood, borough surveyor, engineer:—

Contract No. 5.

Kirk	£39,696 0 0
Keeble	36,000 0 0
Sawers, Brothers	34,951 0 0
Dickinson & Olliver	33,890 0 0
Ivery	30,500 0 0
Chappell	30,200 0 0
Webster	29,900 0 0
Pickering	29,602 0 0
Crockett	29,000 0 0
Wigmore	27,150 0 0
Blackmore	25,844 0 0
Moore	25,486 0 0
Morris	25,400 0 0
Nicholson	24,950 0 0
Neave & Fry	24,827 0 0
Cheesman & Co.	24,600 0 0
Bloomfield	24,553 0 0
Phillips	22,978 0 0

For additions and alterations at the Sussex County Lunatic Asylum. Mr. H. Card, architect. Quantities supplied by Mr. B. H. Nunn:—

Bushby	£4,648 0 0
Deacon	4,050 0 0
Pannett	3,990 0 0
Parsons	3,740 0 0
Howell	3,697 0 0
Chappell	3,657 0 0
Peerless	3,655 14 2
Cheesman (accepted)	3,600 0 0

For house and shop, in North-road, Brighton, for Mr. Balcombe. Mr. John Hill, architect. Quantities supplied:—

Hall	£903 15 0
Marshall	800 0 0
Hampton	773 0 0

For house and shop, for Mr. A. B. Laws. Mr. John Birnie, architect:—

Hobern	£1,650 0 0
Thomas	1,550 0 0
Crabb & Vaughan	1,525 0 0
Best	1,467 0 0
Johns	1,399 0 0
Hollidge	1,390 0 0
Chapman	1,375 0 0
Wolsey	1,330 0 0
Peskett & Taylor	1,325 0 0
Ward	1,290 0 0
Pollard	1,280 0 0
Lose	1,267 0 0
Hunt	1,249 0 0
George	1,239 0 0
Wright	1,215 15 0
Turner	1,172 0 0

For alterations and additions to No. 6, Fore-street Parade, Taunton, for Mr. J. C. Brown. Mr. James H. Smith, architect:—

Shewbrooks	£998 0 0
Moss & Randell	889 0 0
Giles	832 0 0
Manham & Dinham	756 0 0

For a ground-floor shop only, with basement, near Newcastle-street, Strand, for Mr. J. H. Ferrier. Mr. J. H. Rowley, architect. The quantities supplied by Mr. J. J. Green:—

Rivett	£633 0 0
Hill, Keddell, & Waldram	619 0 0
Macey	599 0 0
Crabb & Vaughan	596 0 0
Browne & Robinson	586 0 0
Beeton	583 0 0
Brass	561 0 0
Killby	534 0 0
King & Sons	526 0 0
Kelly, Brothers	513 0 0
Scrivener & White	512 0 0

For proposed alterations and additions to a house, at Abingdon, for Mr. Pauline Martin. Mr. Edwin Dolby, architect:—

Townsend	£255 0 0
King	255 0 0
Drew	240 10 0
Williams	235 0 0
Bryan	225 0 0
Davis	221 7 3

For finishing houses, St. Luke's-road, Bedminster Bristol. Mr. W. Cloutman, architect:—

Contract No. 4.

Summons	£275 0 0
Stephens	263 12 0
Perkins & White	223 0 0
Howell	211 15 0
Millett	208 1 10
Hook	194 0 0
Leat (accepted)	190 0 0
Hobbs	189 0 0
Lloyd	185 0 0

Contract No. 5.

Perkins & White	587 0 0
Millett	500 8 0
Lloyd	490 0 0
Hobbs	481 0 0
Howell	461 5 0
Stephens (accepted)	399 0 0
Harding	360 11 0

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Nightingale	999 0 0
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Thompson & Smith	837 0 0
Blower	830 0 0
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Snowden	743 0 0

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Cohen (accepted)	£2,075 0 0

For building house and shop, Exeter-place, Walham-green, for Mr. David Oldfield:—

Taylor & Pitts (accepted)	£460 0 0

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J. P. (out of our line).—Architect (various circumstances would have to be inquired into. We might mislead by answering generally).—A. Z. (we are forced to decline).—R. P. P.—Mr. A.—H. C.—M.—C. O. E.—W. G. B.—H. L.—J. H. S.—C. C. H.—J. E. & Son.—J. C.—A. M.—E. B.—Col. W.—J. D. D.—E. D.—A Newtowner.—S.—C L.—J. H. R.—T. & J. S.—B. W.—Lord L.—W. C.—E. H.—T. J. H.—J. B.—E. G.—R. G. S.—Nemo.—H. T. [E.—C. & F.—Z. P.—D. T.—J. W. N.—D. & B.—W. P.—L. H.

We are compelled to decline pointing out books and giving addresses.

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The Builder.

VOL. XXVIII.—No. 1414.

Memorials of Temple Bar.

HILE Temple Bar is, probably, the widest known of all the vestiges of Old London; at the same time, it is the least known. Striding in its present shape one of our chief thoroughfares, there are few strangers who do not speedily, and warily too, thread its narrow ways; and the Londoner must lead a warped life whose business or pleasure never brings him within sight of it. But for all that, few people know much about it. Not one in a thousand knows, for instance, the use made of the chamber over the central archway at the present day; and we shall be speaking within bounds when we add that not one in ten thousand is aware of the purpose it served in old times. There is, it is true, a general impression that the present structure is one of the designs of Sir Christopher Wren; and ever and anon the question of its destruction, or removal to some other site, is discussed and dismissed. The history of the fabric is, however, a wonderment, save in a limited circle. But now a citizen, who rejoices in being the descendant of other citizens, has stood forth as the historian, and, incidentally, the champion of the Bar, and in a painstaking and careful volume has noted most of the scenes and many of the people associated with it.* Somewhat of the jostle, hustle, rattle, and rumble of the crowded thoroughfare the building spans comes to us as we read, owing to the author's desire to include kindred topics and adjacent courts and alleys in his history, which introduces a greater number of figures into his picture than we should have chosen. But on clearing the ground around the main subject of his work, the history of Temple Bar can be thus read:—

In the reign of Edward I. (1301) a grant was made to one Walter le Barbour of "a void space in the high street in the parish of St. Clement Danes, *extra Barram Novi Templi*." This is the earliest known mention of the famous gate between the City and the old court suburb. In the reign of Edward II. the inhabitants of Westminster petitioned that monarch for a remedy for the bad state of the road between the palace and "*la barre du Novel Temple de Londres*." They declared they were greatly interrupted in their traffic by the mire in the rainy season, and by the thickets and bushes. In the reign of Richard II., Wat Tyler, at the head of his great gathering, is said to have destroyed the bar, as well as two forges, one on either side of St. Dunstan's Church. Thus we gradually realise the roadway through the open country, with a sprinkling of houses along the way, here and there a glowing forge, and then long lengths of tangled hedges straggling over the trackway and narrowing it. But it is not clear that the bar took the form of a structural gateway at this early date; and it is possible that it was but a bar, literally, or chain stretching from post to post across the road. The first mention of a building on the site that Mr. Noble has been able to find belongs to the reign of Henry VII., and occurs in the records of the City:—

17 Hen. 7 [1502.]

Broke Aldn, ffabian. Johes Warner, nup Vic. } *Assignate ad custodiend Portas de ludgate, Nugate post un domo ordis ffruim, p'dicator nec non barres Novi Templi.*

After this, the accounts of pageants and processions give us many glimpses of the Bar, always as a building, and nearly always as newly painted, repaired, or decorated, to meet the exigencies of the respective ceremonials with adequate state. Stow's description of the procession of Anne Bullen from the Tower to Westminster Abbey, on the occasion of her coronation, in 1533, says the bar was "newly paynted and repayred" for the occasion, and that a group of singing men and children stood there to salute the young favourite. Again, when Edward VI. passed through the bar to his coronation, in 1547, we hear that it was "painted and fashioned with battlements and buttresses of various colours, richly hung with cloth of arras, and garnished with fourteen standards of flags; there were also eight French trumpeters blowing their trumpets, after the fashion of their country, and a pair of regals with children singing to the same." This procession was made the subject of a set of paintings long preserved in the dining-room at Cowdray, in Sussex, which were attributed by some to Holbein, and by others, with more probability, to Bernardi, and which were unfortunately burnt in the great fire there in 1793. One of these paintings showed Temple Bar. We may see it, too, in Hollar's map, gabled, with a central gateway and two foot-passages, with the royal arms and those of the City set up over them.

When Queen Mary was crowned, the bar was again newly painted and hung; and when she was about to be married, it was resolved that a new pair of gates, that were to be good and substantial, should be set up there. Mr. Noble thinks it likely the former ones may have suffered in the rebellion of Sir Thomas Wyatt, who, it will be remembered, was taken prisoner by Sir Maurice Berkeley "by the Tempull Barre." The City records set forth that the new gates were completed in the course of a few weeks:—

"1 & 2 Phil. & Mary, 23 Oct. [1554].

Item yt was agreid that Mr. Chamb'leyne shall com'ytt the custodye of the key of the new gates, now sett up at Temple Barre, to the cyties ten'nte, dwellinge nyer unto the saide gates, takinge nev the lesse especial order with hyme, for the shutinge and openynge of the same gats at convenyent houres."

Queen Elizabeth was the central figure of the next ceremonial in which Temple Bar was one of the chief stations. When she passed to her coronation through the leading streets of the City, and came to this boundary, she found the bar in possession of giants, who bore in their hands, above the gate, a set of Latin verses painted on a tablet, and a translation of them, on a smaller tablet, in "English meter." A group of singing children stood at the gate, too, as on former occasions; and one of these little ones, "richly attyred as a poet" (Pope had not located the whole army of poets in Grub-street in those days) stepped forth, and bade her farewell, as she left the confines of the City for those of the Court. "Be well assured I will stand your good queen," was her reply. This queen revisited the citizens several times; and once with extra state, when she went to St. Paul's to return thanks for the defeat of the Spanish Armada. The City waits were posted on this occasion on Temple Bar to salute her with minstrelsy.

Still more sumptuousness was exhibited when the King of Scotland made his entry into London to be crowned King of England. Ben Jonson, as poet, was among the workers who were employed to make his progress as royal as possible. A temple was erected against Temple Bar, 57 ft. high and 18 ft. wide, with a passageway 12 ft. wide. It represented the Temple of Janus; and in it were Peace, with Wealth in attendance upon her, and War grovelling at her foot; while four handmaids,—Quiet, Liberty, Safety, and Felicity,—asserted dominion over Tumult, Servitude, Danger, and Unhappiness, who lay at their feet. As the king approached this edifice, the heart of the City was placed upon an altar within, and offered as a tribute. Gilbert Dugdale says of this structure, "It was neither great nor small, but finely finished. Some compared it to an exchange shop, it shined so in the dark place, and was so pleasing in the eie; wherein a young man, an actor of the cittie, soe delivered his mind and the manner of all, in an orration, that a thousand gave him his due deserving commendations." Great magnificence, too, was displayed when Charles II. passed through the City to be crowned. Evelyn, we know, was among the crowd near Temple Bar, on the Strand side, and "blessed God;" and in a balcony erected over the gateway stood the Duchess of York; while close by were drawn up the benchers and others belonging to the Inns of Court. At the bar "was a delightful boscage full of several beasts, both tame and savage," and eight waits ever and anon filled the street with music. The houses fluttered with tapestry, and the roadway was strewn with flowers on this occasion.

But there were other sights the old gate saw before it was demolished and the present structure erected on its site. Here is an unhappy knight, Thomas de Turbeville by name, on his road to the gallows. He had been taken prisoner by the French at Rheims; had returned to England as a spy; and, having been tried and convicted, is now being drawn on a fresh ox-hide from Westminster to Cheapside previously to his execution. Few of the citizens that saw this ghastly sight lived to see the commotion caused by Wat Tyler's mob, as the great unwieldy mass marched to the Savoy Palace to destroy it; for this last terror was felt eighty-six years subsequently to the horror expressed at the knight's ill-fate; but many who made way for Wat Tyler saw a smaller concourse in 1392, when there was "a grete debate in Flete-strete" between the servants of the Bishop of Salisbury and the citizens, which led the king to take a large fine of London, "or he wolde be pleysd." And now it is night, and a dead goldsmith, slain outside "Tempull Barre," is dragged by the merciless guilty slayer down to the water's edge and thrown under the "Tempull bregge." Here is a sad scene, too, in broad golden daylight. Eleanor Cobham, Duchess of Gloucester, is doing penance, walking bareheaded, with a large wax taper in her hand, to St. Paul's, to make an offering at the high altar. Her enemies declare she has a wax image of the king upon which she has wrought the ill that has resulted in his sickness; and, although they are going to let her off with penance and a life-long imprisonment, they have hanged one of those they call her confederates and burned another. Who is this broad-shouldered, thick-set personage, dressed in one of the coats of the guard of bluff King Hal, passing through the bar? It is no other than the king himself coming into the City *incognito* to see a periodical spectacle in which royalty took no part. As he strides along the footway, carrying a halbert over his shoulder, 2,000 horsemen are mustering round a galaxy of burning

* Memorials of Temple Bar; with some Account of Fleet-street, and the Parishes of St. Dunstan, and St. Bride, London. By T. C. Noble. London: Diprose & Bateman.

cressets, for the purpose of marching through the wards to see that they are properly watched and lighted. The life and gaiety and unusual character of the scene have so many charms for him that he resolves to bring his queen for the time being to see it. And on St. Peter's Eve they both arrive in state to be spectators of the citizens' magnificence. The old gate saw, too, more riots than we care to count. Now they were 'prentices who were "out;" now it was a Lord of Misrule; then the Earl of Essex; and now, again, it was but a scuffle to obtain possession of a sword, that converted his Majesty's highway into a sea of heads, and filled the air with the roar of many voices. But now and then it looked down upon sights that we must not pass by. On the 19th October, 1637, for instance, an ambassador from the Emperor of Morocco arrived in London, and on Sunday, attended by a goodly company, proceeded to Westminster, taking with him four Barbary horses, resplendent with embroidered saddles and golden trappings, sent by his Emperor as a present to the King. Two Moors were among the throng, the one carrying the ambassador's scimitar, and the other his slippers and trappings; and behind marched eighteen captives whom Master Robert Blake had redeemed from slavery. Let us stand aside again whilst a procession of another kind passes. It is the funeral of a murdered man, Sir Edmundbury Godfrey, and as it stretches through and finally clears the bar, we may count seventy-two London clergymen walking two abreast before the body, and a thousand others following. A great concourse looks on silently.

Hackney coaches, about this time, began to rumble through the bar, and stand in the Strand, much to the chagrin of the watermen, who opposed them right and left, and petitioned the king to prohibit them from plying and carrying people east and west, and to and fro; and the unwary populace often failed to get out of the way of the unskilled drivers, and lives were lost.

Here is a group of excited citizens round the bar now, while the Lord Mayor is presenting the City sword to a grave-looking gentleman in an olive-coloured coat with gold buttons and loops, and a gold band round his hat, who is on his road to dine with the chief citizens. The grave stranger thus honoured is Oliver Cromwell. Thirty years later, 200,000 people are abroad enjoying a fantastical procession, formed of mock cardinals and bishops, which precedes a mock Pope, who, at Temple Bar, is jerked out of his chair of state into a bonfire. But between these two events there occurred the Great Fire, which burned Fleet-street as far as the third house from St. Dunstan's Church on the north side, and exactly opposite the church on the south side. The bar was one of the posts of guards placed to prevent the spread of the flames; and the officers in command of it were Lord Bellarges, Mr. Chicheley, and Mr. Hugh May, who were empowered to appoint sub-commissioners to distribute the biscuit and cheese allowed by the king to those that assisted in this duty. On the night of September 6, when Lord Oxford made his rounds, he found Lord Bellarges, Mr. May, and the constables had all quitted their posts, leaving Mr. Chicheley in sole charge. But the fire did not attack the old gabled barrier.

We first hear of the intention to build a new gate upon its site in the following entry in the City archives, authorising a consultation with Inigo Jones:—

"12th Charles, May 5, 1636.

Item according to an order of the Lords of his Maties most honble Privy Councell of the xxviiith April last, it is order'd that Mr. Recorder, Mr. Aldran. Ffen, Sr Morris Abbott, and Mr Aldran. Garraway, that were lately before the Board touching the repaire of a house at Temple Barr, shall meete and conferre with Inigo Jones, esq., Srveyor Genall. of his Matie. Works, touching a convenient gate to bee built in that place."

Kent published an engraving of the design that was furnished by Jones in compliance with the instructions he received at this conference, and a MS. in the Harleian Collection gives us every particular of it. The design was not, however, carried out; and it was not until after the coronation of Charles II. that the subject was again discussed. About three years after that event the Council of the West, Mr. Noble finds, intimated to the Council of the East that it was very desirable to rebuild the gate; and in an Act for repairing the highways, in the fourteenth year of the same reign, there is a proposal to widen, among others, "the passage att Temple Barr." But still nothing was done, for the widening of Temple Bar was urged anew in a paper upon City nuisances, particularly irregular timber buildings, read to the Privy Council by Sir John Popham in 1664. Further on we find Charles writing to his trusty and well-beloved Mayor, Recorder, and Aldermen, desiring them at once to proceed to widen the bar in conformity with the recommendation in the Act, and promising them he would aid and encourage the work. Among the architects who took an interest in this question was Sir Balthazer Gerbier, knight, whose academy for teaching arts and sciences was the predecessor of the Royal Academy, and who, it will be remembered, wrote "A Brief Discourse concerning the Three Chief Principles of Magnificent Building, viz., Solidity, Conveniency, and Ornament," in which he addressed Parliament, in the preface, as follows:—

"To the Lords and Commons assembled in Parliament, —May it please your honours: It being lately reported that your honours have deliberated to have the streets made clean, to enlarge some of them, and to build a sumptuous gate at Temple Barr, I thought it my duty to present this small discourse of the three principals of good building, and with all a printed paper concerning the cleaning of the streets, the levelling the valley at Fleet Bridge with Fleet-street and Cheapside, and the makeing a sumptuous gate at Temple Barr, whereof a draught hath been presented to his Sacred Majesty, and is ready also to be produced to your honours upon command, with all the devotion of

Your honours' most humble and most obedient servant,
B. GERBIER DOUVILLY, Knight."

Their honours never commanded the production of this design, and the Great Plague and the Great Fire postponed the consideration of the question till 1668, when a meeting was arranged between the City officers and the king's commissioners to confer about the business of the improvement of the bar. A year later, and we find the City council in communication with Sir Christopher Wren, and by-and-by, the lord mayor relating to his fellow officers how he was sent for by the king, and pressed to accept the sum of 1,005*l.* out of the revenue arising from hackney coaches, to which they had hitherto demurred, as a fitting assistance from his Majesty towards the rebuilding of the gate and widening of the way through it. He added, that he accounted for the delay by urging the great expense incurred by the fire, and the consequent rebuilding of public works, and the still large outlays required; but that the king insisted they should take down the said bar and buildings, and accept the said 1,005*l.*, and made his royal pleasure less exacting, by promising that when that sum was expended he would take care they should have another, either out of the tax upon hackney coaches or from some other source. This royal interview sealed the fate of the bar; and within two years from that date, in the twenty-fourth year of the king's reign, Sir Christopher Wren erected the present structure.

Mr. Noble has looked through the Guildhall books, and found several entries relating to the new building. Those of the most interest prove that Joshua Marshall and Thomas Knight were the masons employed, and John Bushnell was the sculptor of the four figures in the niches. Joshua Marshall was the son of Edward Marshall, master mason to Charles I.; he carved the fine pedestal of King Charles's statue at Charing-cross, usually attributed to Grinling Gibbons, and erected the Monument. Walpole gives an interesting account of Bushnell, the sculptor. He commenced to build himself "a large house fronting Hyde Park, in the lane leading from Piccadilly to Tyburn;" and dying, of a disordered brain, his sons lived in the shell of this house, with neither floors nor staircase, in an eremetical kind of way. For the four statues upon the bar, Mr. Noble finds Bushnell received 480*l.*, which sum was paid in instalments spread over ten years. Counting 700*l.* paid to Marshall and Knight, 12*l.* to Anthony Tanner, bricklayer, and other sums in fees and compensation, the total of all payments is 1,397*l.* 10*s.* Scarcely had the newness of the fabric begun to tone down, before a proposal was set on foot to remove it altogether. The extra traffic caused by the hackney coaches evidently led to its enlargement, and now the enlargement of the accommodation upon the road called for its removal. John Gwyn, in 1766, seems to have been the first to print a proposal to do away with the time-honoured barrier, though it appears the corporation went so far as to make provision for the lessees to quit possession at six months' notice, in 1759. Thirty years after this last date, Alderman Pickett, exasperated at the constant block of vehicles at the bar, doubtless, presented a petition, signed by the most respectable inhabitants of the district, praying the Court of Common Council to remove this and other impediments to their progress. There was great excitement with much talking and writing over the matter, as one selected "prophecy," by John Williams, will indicate:—

"If that gate is pulled down 'twixt the court and the City,
You'll blend in one mass prudent, worthless, and witty.
If you league cit and lordling, as brother and brother,
You'll break order's chain, and they'll war with each other.
Like the great wall of China, it keeps out the Tartars
From making irruptions where industry barters."

But the bar had too many friends in the City, if not at court, to be rooted up in any such unceremonious manner; though Alderman Pickett's indefatigably urged scheme for the removal of impediments was acted upon ultimately, as far as the demolition of Butcher-row was concerned.

We have said few are aware of the use now made of the chamber over the central gateway. In old times, as our readers will have gleaned in the course of our remarks, it was let as a residence, just as Aldgate-gate was let to Geoffrey Chaucer. But at the present day and for many years past, it has been in the occupation of Messrs. Child & Co., bankers, and is fitted up with shelves, on which are ranged their army of ledgers. Mr. Noble gives a very interesting chapter on the banking-houses of Fleet-street, and in course of his acquisition of information for it, was allowed to inspect this chamber over the central traffic of the great highway. It is entered from the first floor of their banking-house "by a series of steps, iron doors, and a passage, the approach certainly carrying in one's mind the idea of it being the entrance to a prison cell," he relates; or, as the ledgers would suggest to many, to a bridge of sighs. Charles II., Nell Gwynne, Samuel Pepys, and Prince Rupert had accounts with this great firm. In the first-floor room of the banking-house, over the chimney-piece, he noted a painting, by Michelangelo Rooker, of the City side of the bar, with, as he puts it forcibly, "the luckless skulls of luckless traitors spiked upon the summit of the gate;" and in the same apartment hangs a portrait, by Sir Thomas Lawrence, of the recent head of the firm, Lady Sarah Sophia Child, Countess of Jersey, arrayed as for the coronation of George IV. The member of the firm who permitted him to tell us these and other facts, he adds, is a descendant of the great "Spectator," whose writings have helped, as much as Dr. Johnson's association with the locality, to cast that halo round the bar that has hitherto prevented its destruction.

Like the Memorials of London Life compiled from the City archives by Mr. Riley, and noticed in these pages, Mr. Noble's "Memorials of Temple Bar" picture the middle classes, and, in the great crowds, the lower classes, rather than, as a rule, the upper ten thousand, and special favourites of fortune. Prince Rupert's fluttering plume and sparkling jewels, or Mistress Gwynne's gay coach, may occasionally have brightened the surroundings of the bar and the routine of every-day business; but the great stream of passengers on foot, in coaches, and on horseback, that constantly flowed through the gateway, was composed in the main of the industrial classes. When he has duly chronicled the pageants and processions that have been, down to the arrival of the Princess Alexandra, Mr. Noble passes on to the worthies that have lived in Fleet-street, the great goldsmiths, as we have seen, the famous taverns, the clergy and benefactors of St. Dunstan's Church, extracts from the register, with insight into sorrows and joys of the Marshalls, Masons, Isaac Walton, the families [illegible]-Cavendish, Somerset, Wentworth and Tal[illegible] and others; and thence to the Temple and [illegible] of Court, Whitefriars, the three old theatres, the Fleet River and Prison, and Bridewell. One sensational aspect of Fleet marriages, however, he has missed. In Burn's "History of Fleet Marriages" it is recorded that a certain woman "ran across Ludgate-hill in her shift," under the impression, it is supposed, that in going to her husband without any property he would not be responsible for her debts.

Among the curiosities which the author has so industriously and appreciatingly grouped together, is an account of the various Fleet-street exhibitions, from the mandrakes, in 1611, to the fire-eater in 1718, who sucked a red-hot poker five times a day; and including Mrs. Salmon's waxwork, at the sign of the Golden Salmon, Temple Bar, removed from the Golden Salmon in St. Martin's, near Aldersgate, because of the

greater conveniences "for the qualities' coaches to stand unmolested." Like Miss Linwood's needlework in our own time, Mrs. Salmon's figures outlived their popularity, and were, ultimately, sold for 50*l.*, in 1812. The signboards, tokens, courts, are next treated, and even the occupants of some of the shops at the present day are named, and their descent from former celebrities related. Thus it will be seen that incompleteness is not a fault that can be found with the memorial before us. On the principle that last need not be least, Mr. Noble devotes his concluding chapter to a history of the Fleet-street printing-press. Wynkin de Worde, "in the Flete-strete in the sygne of the Sonne," heads the long line of illustrious publishers who have helped to make the locality the very core of letters. Pynson, who printed the Chronicle of Fabyan, the alderman whose name occurs in the first entry on the City books relating to Temple Bar as a structure, and Froissart's Chronicles, worked at his press at the "Temple-barre of London." When we call to mind, as we look further down the list of printers, that some of Shakspeare's works, and those of Milton, Quarle, Walton, Butler, Dryden, Cibber, Pope, Gay, Rowe, Swift, Disraeli, Sir Walter Scott, and Byron, have been published within a small radius of this gateway into the City, we must allow that Mr. Noble would have passed over an enthralling phase of the attractions of his subject if he had not noticed the many eminent booksellers whose houses have been founded in the locality; though, on the other hand, this comprehensiveness crowds his canvas as much as the precincts of the bar have been crowded on State occasions and in troubled times. Just, however, as the looker-on can always find entertainment in a great gathering, so every reader will find something to his taste in the thronged little volume we now close with compliments.

PROFESSOR SCOTT ON ARCHITECTURE, AT THE ROYAL ACADEMY.

LECTURE II.

IN my last lecture* I explained the general principles of groined or intersecting vaulting, and just carried on the subject through its simplest case,—the covering of a square space, or any repetition of square spaces, by the intersection of semi-cylindrical vaults; and I just showed how, by emphasising the outlines of the squares so covered by means of transverse ribs or angles, and by placing impost mouldings, pilasters, columns, or colonnettes in the sustaining piers, such a mode of covering a space might be readily made at once susceptible and suggestive of architectural treatment.

Let us now proceed to consider the application of the same principles to the vaulting of spaces of other forms than the mere square.

The next form, perhaps, in point of simplicity is an equal-sided polygon,—say, for example, an octagon. We must here suppose eight cylindrical vaults crossing one another from the opposite sides of the octagon; and it is clear that their intersecting lines will be the diagonals or lines joining the opposite angles of the octagon, which will coincide in position with the transverse ribs. The only objection to this form of vaulting is the low proportion of the arches produced by these intersections, which, though more than twice and a half the width of the side arches, only rise to the same height, or about one-fifth of their span,—a defect which will be remedied by a development I shall presently have to describe. Just as the half-dome (as seen in the chapel of the Tower of London) forms a natural covering for an apsidal termination of a barrel vault, so a portion of a polygon, thus vaulted, would *appear* to be the co-relative apsidal termination of a *groined* vault. A difficulty, however, at once presents itself in the small height of the vault last described, which is not one-half of the height of the semicircular vault which it would have to meet. How, then, is this to be got over? How are the vaults proceeding from the narrow arches of the sides of the octagon to be brought to range in height with the wide vault which spans the whole space?

The solution of this difficulty will be better considered by means of a simple and more familiar case. The intersecting vault in its most normal form is plain enough in its application to a square compartment, but becomes difficult when applied to a space longer one way than the other; yet oblong spaces continually present themselves as requiring to be vaulted.

Mathematically this is readily met, and that with perfect accuracy, by making one or the other of the intersecting vaults *elliptical* instead of *circular* in its curvature; making, for instance, the narrower arch a semi-ellipse with its longer semi-diameter vertical. This, however, is an unsightly form, and was always rejected, though the natural mode of effecting the object, and though it would give intersecting curves which would be complete and in vertical planes.

The Roman builders solved the problem, at the sacrifice of mathematical accuracy, by what is called *stilting* the narrower arch; that is, raising its springing till its crown becomes level with that of the wider arch. This is a practical solution of the difficulty, but is not a very pleasing one, inasmuch as the line of intersection is most uncouthly twisted, and, in point of fact, begins at considerable height above the springing of the vault.

To go back, however, to our previous case of the apsidal termination of a vaulted space, it affords a very fair solution of the difficulty by which we were before encountered; for it is clear that the arches on the sides of the octagon may be lifted up till their crowns become level with that of the main vault; and, as the intersecting angles of a polygonal groined vault coincide with its transverse ribs, we have nothing to do but to raise from every angle a transverse rib similar, or very nearly similar, to those of the main vault, and to make the smaller vaults of the octagon to intersect upon them. There will be a little geometrical inaccuracy in the forms of these cells of vaulting; but, as the angle ribs would assume correct lines, these inaccuracies would not seriously offend the eye.

There is, however, another method of meeting the difficulty; but before describing it, I will say a few words on the treatment of other difficulties resulting from the irregularities in form of spaces which have to be vaulted.

Let us, as an example, suppose an aisle or corridor passing round such a polygonal figure as we have been considering. It is manifest that its compartments will have a form enclosed by unequal sides, or, to say the least, one side will differ greatly in width from that opposite to it.

The stilting system before mentioned is the most obvious method of getting over the difficulty. It may be, that three of the arches surrounding such a compartment may be about equal, and no great difficulty would occur as to *their* intersection; but the fourth, being far narrower, would have to be stilted to raise its crown to the level of the others, and its lines of intersection will consequently be more or less disturbed.

The difficulty is, in early specimens, increased through the apse being usually round instead of polygonal; though this does not very materially alter the case. We have in London two excellent examples of this apsidal aisle: that in the chapel of the Tower of London and that in St. Bartholomew's Church in Smithfield. The former of an early and the latter of a later type.

In both, the narrow arches are greatly stilted; and at first sight the two may appear to be similarly treated; but on closer examination there will be found to be much difference between them. In the Tower Chapel the transverse ribs are made to increase prodigiously in width towards the outer wall, so as to reduce the want of parallelism of the groined compartments, a very unsightly expedient; and the capitals of the columns are square, which makes the backs of the arches they support nearly double the width they present in front: while at St. Bartholomew's the ribs are of uniform width, and the capitals, instead of being square, have their sides radiating from the centre of the apse, so as to share with their arches the spreading of their outer side. The difficulty is really increased in the later work, but is met by more skilful workmanship somewhat similar to the case of the aisle round a semicircular apse, in the case of vaulting a circular building with a central pillar. In each, the main surrounding vault, if uncut by others, would assume the form of a portion of an *annulus* or *ring*. In the aisle such a ring would be wide in the opening it surrounds, but in the circular building its opening would be reduced to the diameter of the central column or its capital.

This annulus, or curved vault, would become divided in plan into triangular portions by the transverse ribs which would meet on the central pillar and the cross vaults, proceeding from the surrounding arches, would intersect with only the *outer portion* of the vault, the *inner portion* which rests on the pillars being uncut by them, and assuming the form of a concave conoid, something like the flower of the convolvulus.

This form of vault is well seen in two instances in the cathedral at Worcester. The best known of these is the chapter-house, a circular building, between 50 ft. and 60 ft. in diameter, whose circumference is divided into ten parts, from which small ribs run across to the central pillar. The intersecting cells of groining are at present *pointed*, possibly the result of a subsequent alteration, and simply intersect with the surrounding vault. In this case the central conoid is broken into a polygonal form to give piquancy to its otherwise too unbroken surface. This may be considered the father of our beautiful polygonal chapter-houses, of which I shall have more to say as I proceed.

The other instance I have alluded to at Worcester is in the crypt. In this, the case in question occurs not in a distinct form, but in combination with an apsidal aisle on the one side, and a vaulted span, with a central range of pillars, on the other; the last pillar, forming the central point of the semicircular apse, is exactly parallel in position, and forms very similar groining to that of the chapter-house.

The same problem, when applied to a polygon instead of a circle, is open to two different modes of solution. In the one, the main vault is always supposed to run from each *side* towards the central pillar; in the other, from each *angle* towards the pillar. I shall, however, have to go more minutely into this when I come to pointed-arch vaulting, to which the last-named system more especially applies.

Having now briefly touched upon the most prominent forms of round-arched vaulting in its more normal form, as resulting from the *barrel* vault and its intersections, I will digress for a short time to consider some of the conditions which relate to what I in my last lecture stated to be the other most simple kind of vault,—the *dome*. I do so, however, not with any idea of treating at large on a form which should be made the subject of a separate lecture, but merely to facilitate the explanation of certain indirect influences which it exercised upon ordinary vaulting.

A dome in its most typical form stands upon a circular wall; this, however, is by no means a necessary condition. It may in reality cover a square or polygonal space just as well; for, suppose a square or a polygon inscribed within the base of a hemisphere, it is clear, from the properties of a sphere, that vertical planes erected on the sides of such square or polygon will cut the hemisphere in semicircles of the diameter of those sides. It follows, therefore, that the walls of a square or polygonal building would intersect with a dome in the form of semicircular arches standing on each of its sides; and, consequently, that such a square or polygon will carry a hemispherical dome, or rather the remainder of it left after cutting the base into a square or polygon.

For our immediate purpose we will limit the case to that in which the inscribed figure is a *square*.

Now, a dome cut in this manner by four planes is not a very sightly form, and needs some embellishment; but if a horizontal circle be drawn within it by means of a cornice resting on the crowns of the supporting arches, it assumes at once an agreeable form, and one which has been largely used both in Byzantine and in modern architecture. My present purpose, however, suggests another mode of giving sightliness to the squared dome. The lines drawn on its surface may lie in vertical as easily as in horizontal planes, and by making such lines pass through the angles of the square, touching the dome throughout their length, and intersecting one another at its apex, we obtain a form not wholly unlike a square groined vault; the great differences being that the intersecting diagonals of a groined vault assume elliptical curves, whereas these are semicircles; that in the one they represent an actual angle, while in the other they are arbitrarily drawn on an unbroken surface; and that the ridges or crowns of the vault in one case are horizontal, while in the other they are raised and circular. This mode of vaulting, though frequent in some parts of France, is seldom found in this country.

There is, however, an instance of it in the vaulting beneath the tower of Goring Church, Oxfordshire.

Though this is not really *groining*, but a disguised dome, there is a ready process by which

* See pp. 1[illegible]84, *ante*.

it may be, and continually was, converted into genuine groining.

I have defined the barrel vault as the prolongation of an arch in a direct line at right angles to its plane. But an arch may be prolonged in other than a straight line. Let us in the previous figure suppose the arches which rise from the sides of the square to be prolonged, not horizontally, but in a curve rising as it proceeds, and so regulated that the semicircle as it moves forward retains its vertical position, and is guided in its motion by the diagonal lines drawn in the dome. This process at once generates a new form of vault. For each of the triangular gores of the dome we now substitute a vault, of which every vertical section parallel to the side of the square is a portion of a circle of the same diameter with those raised on the sides, while the angles of the intersection of these newly generated vaults are themselves semicircles. It is a perfectly accurate geometrical figure, none of whose salient lines are other than portions of circles, though the ridge or crown lines now become elliptical. It is a most useful development, as being much stronger than the ordinary groined vault. Oddly enough, it has—so far as I am aware—no suitable name. It is usual to speak of such vaults as being "domed up," but this is a very rough description. When adapted to the pointed arch, it has been called by Mr. Petit the Angevine vault. I know no better way of describing it than as round-arched vaulting with a raised ridge.

Now, though less obvious at first sight, the very same processes are applicable either to an oblong, to a tapering four-sided figure, such as the bay of the aisle of an apse, or even to one of the triangular compartments of the apse itself, or of a circle.

For, in either case, we have only to cut out the required slice from a hemispherical dome, to draw the diagonal lines from the angles of such form to the apex, and then to substitute for the gores of the dome the vault generated by the motion of the semicircle produced by the plane of the sides of the figure parallel to itself, and rising under the guidance of the diagonal lines. This process it will at once be seen, is capable of solving all the problems of irregular figures which I have enumerated at an earlier stage in my lecture, without the aid of stilting, and without giving intersecting curves which deviate from the vertical plane, while it avoids the use of the ellipse for any prominent line.

The last case I have named—that of the triangular gore of an apse, or circle—also solves the difficult case I mentioned at the beginning of this lecture as arising in the groining of a polygon, owing to the excessive lowness of the arch formed by the intersecting angles. These are now raised to the full height of a semicircle, while if half of such a polygonal vault be used for an apse, it agrees in height with the main vault without the use of stilting.

It may, however, be mentioned that, as stilting is sometimes most useful in making room for windows, it was not superseded by this invention; the two systems continuing to be used at pleasure, and sometimes a union of the two, which, however, is so arbitrary as to defy definition. The form last described for a vaulting circle is often used as a variety of the dome by raising numerous small arches round its circumference, and giving a sort of fluted or shell-like surface to the dome.

I think I have now described the principal varieties of round-arched vaulting with two exceptions. The one is that in which the side vaults of oblong compartments cut the higher and main vault at a level lower than its crown. This is vulgarly known as "Welsh" groining, and though not quite pleasing in effect, it is a very legitimate mode of covering an oblong compartment. It is customary to obviate the unpleasing coal-scuttle shape of the true line of intersection (such as may be seen in St. Martin's Church) by making them take the lines given by vertical planes, and throwing the geometrical curve into the surfaces of the cells where it does not strike the eye, or perhaps generating them by the motion forward of the side arch. This has been done in the Sistine Chapel, and Mr. Smirke has, I think, done the same in our Great Exhibition Room above. In a ceiling to be decorated with painting, this form of vaulting possesses the great advantage of being the central range unbroken by diagonal lines.

The other form I have omitted is the square or polygonal dome, or that generated by the intersection of vaults running parallel to the sides of the base, instead of, as in the groined vault, running at right angles to them.

The *square* dome is, in fact, the exact correlation or complement to the square groined vault. Like it, it is generated by the intersection of two barrel vaults of the diameter of the sides of the square; but the parts of such vaults which are retained in the one are precisely those which are omitted in the other. The angular lines are the same, though in the one case the angles *project*, and in the other they *recede*; and while the groined vault is reduced in its bearing to four points in the corners, the square dome demands for its support the whole line of the walls, which, however, it reduces in height to the level of the springing line; while the other allows them to rise in their centres to the full height of the vault. In some cases, as in the vaulting beneath the tower of Grantham Church, "Welsh" groins are united with the polygonal dome, a form quite applicable to the vaulting of an apse.

There is another peculiar feature in the square or other straight-sided dome, viz., that it may be cut by vertical planes, as is the case with the spherical dome. Thus if we inscribe within the base of a square or triangular dome another square or triangle where corners bisect the sides of the original base, and erect upon the sides of this newly-formed figure vertical planes, these will intersect the dome in arched forms, and the parts left will give a new form of vaulting, rising from the angles of the figure, and terminating in an unaltered position of the original dome. This form was not infrequently used, especially in vaulting triangular spaces.

I have now gone through all the normal varieties (of which I can think) of the round-arched vault, and it is time that I should allude to a great step which, after perhaps the first quarter of the twelfth century, was introduced into their construction. I allude to the addition of a moulded rib beneath their intersecting angles. It is clear that these angular lines are, both in reality and in effect, the weak points of plain groining. I have mentioned that the Romans fortified them in construction by using in them stronger material than in the rest of the vault; and the early Norman builders made a feeble attempt to take off from the dulness of the intersection, where it approaches its apex, by artificially sharpening the edge in plastering it; for, without this, it becomes (in a vault where the courses of stone or brick are concealed) almost invisible.

The great step in advance which I have now to mention provided both the construction and the artistic strength which the line required.

It is also clear that any irregularity of form may render these lines shapeless and unpleasing, and it is an obvious gain from an artistic point of view, to adopt a system which will at once render them *pronounced* and *regular*. While, then, the introduction of the angular rib was in many cases a departure from geometrical accuracy, it was a vast gain both in strength and beauty.

In that form of vaulting, which I have defined as that with the *raised ridges*, no geometrical inaccuracy would arise, the angles of intersection being semicircular, and in vertical planes; but in the more ordinary form of vaulting, where these lines are elliptical, that curve being unpleasing, two courses offered for choice: the use of segments of circles for the diagonal ribs, or the bringing down the springing to a lower level than that of the vault. In either case the true geometrical figure has to be departed from, and the error has to be thrown into the vaulting-surfaces, a course which subsequently became so thoroughly adopted as a principle, that it may be received as an axiom that in ribbed vaulting, where the ridges are not raised, the ribs are made of such forms as will satisfy the eye, and the vaulting surfaces made to fit themselves to them as best they may, apart from geometrical accuracy,—a principle which, though it may at first sight offend the mathematical mind, has proved in practice so wonderfully useful, and to offer so many facilities, as to be a sort of *Magna Charta* to the art of vaulting.

This step once taken, round-arched vaulting seems to have completed its work. Square and oblong spaces were vaulted either with mathematical accuracy on the raised-ridge principle, or with deliberate departure from such accuracy on the level-ridge principle. Irregular spaces were covered over by expedients which satisfied the eye, and met practical conditions tolerably well, and many beautful works were the results. The diagonal ribs, too, became a new source of decoration, not only by means of their own mouldings or enrichments, and through the bosses now sometimes placed at their point of intersection, but also because they were suggestive of additional colonnettes, and thus added more richness and intricacy to the piers; and sometimes they were carried upon sculptured corbels, as in the cathedral at Oxford. Among the richest specimens of this vaulting may be mentioned the gateway and the chapter-house of Bristol Cathedral, the chancel of St. Peter's Church at Oxford, &c.*

THE NEW BRITISH INSTITUTION.

THE first Spring Exhibition of the new institution is somewhat of a miniature reflex of the old it would revive, even to the little staircase that brings you into the midst of the picture display,—and has nearly as much of what may be designated "good" to recommend it, as formerly, with no room for those of converse quality. If the phœnix make no great promise of a very bold flight at present as it rises from its ashes, at all events a fair prospect of a renewed life greets its revival; and Mr. T. J. Gullick, with those who have so loyally assisted him in his labour of love for art, and desire to help artists, may be congratulated on its pleasant first view; success being measured by the difficulty of its attainment.

The questions, however, still obtain, as to whether opportunity for exhibiting is a want to exceed that of what is really worth exhibition; and if the numerous calls on painters have not the effect too often of breaking the sovereign into small coin for easy currency.

No doubt, next year will show a better recognition of the favourable conditions under which ambitious performances are invited to contest public opinion in this gallery. On this occasion the most noticeable pictures are contributed by those whose best efforts will be applied in other interests than that of this new society, deserving so much general confidence for its liberal principles and constitutional government.

The Royal Academy acknowledges the desirability of some such aid to ease them of an ever-increasing plethora of paintings; and it is very much to be wished that so available a remedy for probable disappointment as Mr. Gullick's energetic attempt at a re-establishment offers, may be wisely and properly accepted by many who, year after year, depend upon the one chance of one exhibition.

Mr. Peter Graham's admirable power of depicting "Mist and Sunshine," Highland hills, and brawling water, has enabled him to paint a great picture on a small canvas (172),—one that leads in this, the landscape department; as Mr. H. Wallis's charming poem,—that sings the placid delights of spring and early life,—must be allowed to take similar precedence in another. "Blue Bells" (92) that splash the hill-side in their course to submerge the green meadows, were never seen to prettier effect, though they serve but to enhance the loveliness of Nature's most exquisite form of beauty, than in this representation, with graceful female figures to give vital interest to the scene that both bells and *belles* adorn. That Mr. F. Goodall, R.A., countenances the undertaking, "A Sheik's Son," will be some evidence (11), though a livelier token of how long and regularly his best of earlier successes were associated with the old Institution, might have been expected from him than this rather uninteresting study, supplemented with a cleverly-sketched little bit of Eastern fact, "The Potteries, Old Cairo" (55). Mr. F. R. Lee, R.A., contributes two characteristic small specimens, of which "Over the Wooden Bridge and through the Wood" (5) is the better; Mr. T. Faed, R.A., "A Fisher Girl" (10), painted with, even, more than his usual deftness; Mr. W. C. T. Dobson, A.R.A., a clear-complexioned, soft-eyed German peasant-girl, whose appeal in the catalogue, in her own language, is "Forget me Not" (26) (as if it were possible!); and Mr. W. E. Frost, A.R.A., two small studies, "The Daughter of Israel" (27), and a slighter "Sketch of a Head" (36), that help to bring back to recollection the little pearls of pictures by the same hand, bathers, water or wood nymphs, and the like, that in former days were sure to be found on the walls of the old gallery.

Old reminiscences, again, are awakened by "A Welsh Peasant Girl" (52), by Mr. P. F. Poole, R.A., although a green, unnatural hue

* To be continued.

that now suffuses all Mr. Poole's productions, leaves the exquisite colour and power of imitating daylight, or any light and shadow effect, only a recollection. Messrs. Linnell, father and sons, are ably, and therefore very conspicuously, represented. "A Study in the Fields," a pathway skirting acres of ripening corn (46), by Mr. W. Linnell, is especially brilliant and forcible: near this is some capital shadow painting, with beech trees to give cause for the effect, by Mr. W. Holyoake (50); and more depth and darkness, with some grandeur too, in Mr. A. MacCallum's view of "The Cedar Grove, Chiswick" (128). One of the best landscapes here, emanates from Mr. Alfred W. Williams (138), "Through the Woods and over Mountain." With some analogy to Mr. Linnell's reading of nature, there is so much strength of apprehensiveness as well as of power of hand to realise it, that excellence becomes almost individuality in this capital performance.

To return to the figure subjects for a change, Mr. W. Gale has nicely contrasted hale old age with happy unconscious childhood. "The Bee-Master" is manufacturing a hive; and the little child who amuses him during his task by merry prattling, will have his turn at hive-making presently, no doubt (35). Careful finish has been the *ultimatum*, as well as the first intention of this simple composition,—a very agreeable and satisfactory one. In sympathising with the parting of lovers, Mr. Gale is far less successful, unless he meant to make a joke of it (205). Anne Page and Master Slender will ever remain of the world's stage's characters, and it is as difficult now to make a new reading of A, B, C, as of Shakspeare (notwithstanding Mr. Bellew); so Mr. R. Farren (37) has gone ahead with his costume for the sake of variety. It is nicely and prettily done, or it would not be worth mentioning. Mr. Weekes is still a stanch admirer of "Border-riders." And why should he not be? unless bigger thieves who lift, in the time it takes to lift a dropped paper from the floor, and to the tune of thousands—not Scotch,—are worthier of renown. No; the glory of robbers died with the dye of their clothes, though they of the past were easily satisfied fools, indeed, compared with the worse—and their betters—of the present. "Hiding from Pursuit" (53) shows us one of Mr. Weekes's best thieves; and Mr. J. R. Dicksee, one of another sort, if she *were* "Irresistible" (54), which she is not. Indeed she is not half so handsome as "Ophelia," by Mr. T. F. Dicksee (200), who,—we mean Ophelia, not Dicksee,—is not half mad enough to satisfy any jury that she did mischief without knowing what she did or did not—such mischief as those of her sex who cogitate as they sit "In the Firelight" of conscientious reflection, by Mr. W. Maw Egley (61), will guess at and of the intensity of its cruel wrong. There was little hope left for Mr. C. Lucy to throw a fresh light on any incident of Mary Queen of Scots' history after the exhaustive analysis of Mr. Froude. Her forced abdication at Lochleven Castle, A.D. 1567 (87), has so often been painted before, that the last depictor must of necessity be the hindmost: and yet there is much executive skill here brought to bear on this tattered and threadbare subject. Natural fact, as opposed to theory and belief, is worthier consideration if the wish is to reach general conviction. So thinks Mr. J. Archer, R.S.A. Truth, as it stands, is better worth the sitting than any model who could be used to revive dead dates. Sunburnt, active children give more promise to him for typifying life than any reading of one man's opinions, or any cogitation of his own imagining could help in its real presentation. Such sturdy facts of folks as he portrays owe all the interest they excite to a ready identification. Admirable naturalness and artistic tact will secure for his commonplace young labourers who are "Bringing Home the Heather," or meaning to take it home presently,—for they are resting quiescently to be "took off,"—wider sympathy than any stretched subject from the tomb of history. Mr. J. C. Thom's "French Shepherds going to Midnight Christmas Mass" (113) ask for a cognate acknowledgment for earnest, modest representation of fact, as they plod on their way in the cold winter's moonlight.

"Venus's Looking-glass" (116) is somewhat like a fantastic creation of Mr. Woolmer's and is all the better on that account, though painted by Mr. H. Tidey. "Rosy Slumber" (124) might be taken for the first chapter of obligation entailed by the "Heirloom" (123), though this is painted by Mr. P. R. Morriss, and the sleeping, still more embryo hero is one of Mr. Hayllar's pretty creations, who may wake, perhaps to the contemplation of a notched sword presently—the tale of what he owes to primogeniture.

"Haddon Hall in the Olden Times" (127), by Mr. T. J. Barker, introduces more such promising young sprigs from a time-honoured stem, gaily caparisoned with their pretty white ponies, groomed to a polish that befits them to their riders.

Mr. W. Cave Thomas shows his proficiency as a master in the good drawing of his figures in the allegory of "Angels contemplating Men" (134), achieving thoughtful expression which produces thought, and demands acknowledgment; and though honest opinion cannot, in our case, accord with any great admiration for Professor C. Verlat's "Virgin, Child, and St. John" (31), with those who identify the difficulty of satisfying abstract conceptions of such embodiments,—an idea of the many would be impossible to be realised by one,—this is entitled to great respect. Mr. A. Legros sends a study, broadly and simply treated, of "Le Joueur du Violoncelle" (30), which appertains more to ancient art than to the schools of present date.

Amongst other works we noted in the catalogue are "The Wayfarers" (17), by Mr. Haynes King; "The Black Mount" (44), by Mr. J. A. Houston, R.S.A.; two moonlight effects, by Mr. A. Gilbert, "The Mermaid's Cave" (58), and "On the Coast" (59); "A Lonely Shore—Cloudy Moonlight" (60), a little bit, but very admirable, by Mr. G. F. Teniswood; "Craven Point—a Grey Day" (65), by Mr. J. W. Oakes; "Not Enough" (74), by Mr. A. T. Verhoeven-Ball; "Loughrigg Fell, Westmoreland" (90), by Mr. Sidney R. Percy; "Noreham Castle" (91), by Mr. A. Perigal, R.S.A.; "Goodrich Castle" (98), by Mr. G. Sant; "A Cornfield" (102), by Mr. N. O. Lupton; "Cast Away" (122), by Mr. J. Danby; Mr. C. J. Lewis's large landscape (135); "Il ris Trovaso, Venice" (145), by Mr. G. C. Stanfield; "Watching an Unexpected Arrival" (177), by Mr. C. Castiglione (we naturalise everybody!); "Over the Heath—Summer Storm" (195), by Mr. R. Beavis.

Mr. H. Foley, R.A., is the only sculptor who exhibits on this occasion; his well-known statuettes of "Edmund Burke" and "Oliver Goldsmith" (212—213) are very excellent as likenesses so far as paintings and prints can lead to a judgment.

Again, we wish the "New British Institution" all success.

THE RIVERS POLLUTION COMMISSION AND IRRIGATION.

THE first report of the existing Commission has been issued in a printed form.

It gives a detailed description of the rivers and running waters in the Mersey and Ribble basins; considers the various influences to which river water is subjected; and investigates the pollutions by town sewage and by manufacturing refuse which it has suffered in these districts, and the various remedies within reach. The supply of water and its purification have also been considered.

The Commission propose the establishment of a River Conservancy Board, but they differ individually in detail on this subject, and two reports by the three Commissioners are appended; one signed F. Frankland and John Chalmers Morton, and the other W. Denison, Major-General.

The Commissioners, in course of their report, review what has been done towards the establishment of sewage irrigation. Of most of the examples, as at Croydon, Rugby, Edinburgh, &c., we have already repeatedly given details; but we may run over some of those instanced by the Commission, and indicate their opinions on the subject. The experiments, as our readers know, are mostly partial, or do not deal with the whole sewage of a town. On the whole the evidence of the Commissioners is very favourable to the irrigation principle.

The often-quoted Edinburgh meadows, which they begin with, are not regarded as a good example of the agricultural remedy for the nuisance created by town sewage, which is poured over the limited area in such an enormous quantity that the soil has not fair play given to it as a cleanser, and the water therefore leaves the grass land still filthy and offensive. Even here, however, they observe, we have a remarkable illustration of the purifying power of soil and plant; but the Edinburgh experience is rather one of agricultural profit from the use of sewage than of that perfect abatement of its waste and nuisance which, in the interest of rivers, we desire to see. Altogether there are only 400 acres to a population which must largely exceed 100,000.

Lodge Farm, Barking, is an example of another kind, where the supply of sewage is limited, and where the object has been, from this limited supply, by means of an ample extent of land, to obtain the largest annual produce. But neither here nor at Edinburgh has the sanitary result, or the purity of the water, been the object aimed at, although in the Barking case that object has been incidentally secured. The soil of the farm is considered to be too hollow and porous to allow the most to be made of the manure. Sinking away even in the channels which carry it from the reservoir, much of the sewage is wasted before it reaches the plant, and the remainder which trickles over the surface of the grass remains there too short a time for the entire extraction of the fertilising matter which it conveys. The effluent waters, however, are to a great extent purified. It appears, upon the whole experience, that for every 100 tons of sewage applied, one ton of grass per acre is obtained, over and above the natural produce of the soil and climate; the other results were also considered to be good. The Lodge Farm experience, as regards grass, is said by the Commissioners to represent a return of 5*s.* annually from every individual contributing to the sewage upon it.

The report then turns to a large number of instances of irrigation where the object has been, not only to make a profit, but to abate a nuisance. Such are the cases of Aldershott, Banbury, Bedford, Croydon, Norwood, Rugby, Warwick, and Worthing.

At Aldershott, the reporters remark, the extreme natural poverty of the soil does not seem to have been a hinderance to the efficiency of the process of cleansing by irrigation, and the farm produce was of vigorous and abundant growth. We have here a return of 1,200*l.* from the waste of 7,000 adults, or 3*s.* 4*d.* per head per annum.

In the Carlisle experiment about 100 acres are employed, and the sewage is lifted and deodorised by carbolic acid before it is distributed on the land. There is, properly speaking, no effluent water from the meadow, the whole of the sewage being absorbed by the sandy soil; and there being no drain outlet, the result is not quite so trustworthy as in the other cases; nevertheless, it is concluded from it that the soakage from the irrigated land into the neighbouring river is effectually purified.

At Penrith the drainage of a town of 8,000 people, only partly provided with water-closets, is received on 80 acres of good meadow land, near the Eamont. A little more has been done here than at Carlisle, to distribute the water by means of permanent carriers, but the treatment is otherwise the same, and the result is very similar. A very large stock of cattle and sheep is supported on the land.

At Rugby the nuisance of the sewage is entirely abated, and so much produce realised as to make it probable that the remedy, which has been an expensive one, will yet prove very profitable.

At Banbury a population of about 11,000 people drain into tanks, from which, through a 12-in. pipe, the sewage is driven by steam-power, a mile or more, to the upper end of a farm of 136 acres. By this means the extreme filthiness of the river is now satisfactorily abated. The produce is satisfactory; and it is believed the farm will soon repay rent, costs, and loan.

At Warwick the sewage of 11,000 inhabitants is poured over 100 acres about a mile from the town. The nuisance of the sewage is sufficiently abated, and large crops of Italian rye grass have been obtained, for which there is a ready sale.

The Bedford undertaking is shown to suffice as a sanitary agency, and its ultimate profitableness is said to appear probable. The land at present rented is only about fifty acres, but 500 will ultimately be put to use.

At Croydon the success of sewage irrigation, remark the Commissioners, as a deodorising and cleansing process, is complete. The sewage is much more efficiently purified than that of Norwood.

The Woking results are still incomplete, and are reserved till the issue of a later report: they are, however, sufficiently encouraging to justify the prosecution of the experiment on a larger scale.

The Commissioners recommend that additional powers be given, under proper regu-

lations, to corporations, local boards, manufacturers, and others to take land compulsorily for cleansing sewage or other foul liquids, either by irrigation, filtration, or otherwise; and to obtain easements for culverts and outfalls for drainage through private property, compensation being given for damage actually done.

ARABIAN DESIGN AND ART.

IN the course of the discussion on Mr. J. D Crace's paper, part of which we printed, Sir M. D. Wyatt, after strongly complimenting the author on the mass of information he had brought together for instruction and gratification, said,—The subject which Mr. Crace has so well treated is a deeply interesting one under several aspects. In the first place, it is highly interesting to us from its relation to the development of style, and its connexion with the history of a great family of the human race, under peculiar conditions of faith and social relations. I need scarcely remind you that the germs of the Arabian technical and ornamental arts are to be found in those of the Byzantine empire, to which they had for the most part descended from the decaying Roman empire. If there is anything in Mr. Crace's admirable paper to which any one could take exception—a cavilling in which, indeed, it would be almost wrong to indulge,—it might possibly be that the speaker's notice of the history of Arabian art scarcely sufficiently carried us back to the stock upon which it was engrafted. The victorious armies of the Prophet and his immediate followers speedily carried Islamism over vast tracts of country, upon many of which technical and decorative arts had long been cultivated with signal success. Hence the peculiar conventional character with which the Arabians so early stamped the eclecticism arising from the junction effected at Byzantium, in Asia Minor, Africa, and Spain, between the Orientalism of Persian and Indian arts (as they existed before the Hegira) and the classical type traditional amongst artists and workmen trained on the system of Imperial Rome. I have myself had occasion to point out in this room the intimate connexion which existed between the Persians and Justinian, and its influence on Byzantine art. The peace which was concluded between Justinian and Chosroes Nushirvan was one that was "to last for ever," according to the terms of the treaty; and Persian architects were largely employed by Justinian. Thus we see in the details of St. Sophia an evident departure from both the technicalities and the principles which characterised the old Roman works, and a certain marked anticipation of some of those changes of form and predilection for inlay and surface decoration in structure which were afterwards manifested to a great extent in the works of the Arabs. The second aspect under which this subject is interesting to us as practical professional men,—students, at least, if not masters, of the handicrafts we control,—is the technical basis of this style. This it was which made it vigorous from its earliest date, and has imparted to it the perfection of execution which always characterised it. From first to last it has exhibited the skilful workman compelled to do his best unflinchingly, and obviously to please a master, jealous of good works, who would put up with no half-hearted service. Every artisan, whatever may have been his specialty, engaged on the great works described by Mr. Crace, was a master of his craft, who carried out his work in subservience to the methods and best traditions of his trade, keeping closely to every characteristic of design and workmanship which the materials he used demanded, and which the tools and processes at his command best enabled him to execute. From his intelligence as an operative, his enlightened ideas as a designer, and the perfection which the revival by the Arabian mathematicians speedily effected of the study of geometrical form (which had been carried so far by the ancient Greeks), enabled him to bring to bear upon his special branch of industry, he was speedily in a situation to originate new features in his business, and to make the old ones far more beautiful than they had previously been. Thus in carpentry and joinery, from the very dawn of technical Arabian art, we may observe a clear recognition of the best mode of combining and contrasting both in form and colour, all the various woods which appeared to be at command. Not only was this the case with woods, but we find the same intelligent use of other materials in all the architectural works of the Mahommedans. I differ a little from my friend, Mr. Owen Jones, in what he has remarked with regard to the place and period in which Arabian architecture was most highly perfected. No doubt, it is to be recognised in the earlier portions of the Alhambra, as having attained a thoroughly concreted system, in which, as in perfect Grecian architecture, every part had its definite form and dimension allotted to it, without confusion, and with such true and absolutely mathematical design and setting out as to preclude the possibility of the occurrence of a pattern geometrically inaccurate, or one which does not complete itself in all its parts and repetitions. We find this development of completeness in the Alhambra in its extremest complication, but we find it no less complete, though in a simpler form, in the earlier works at Cairo, such as those of the Mosque Tooloun, and in the Meschita at Cordova. At the same time, we find it associated with better ideas of structure in the technical simplicity of the primitive Arabian system, and in the clear expression of function in every architectural member. Certainly in the Alhambra, with which I am myself better acquainted than with the monuments of the Khalifate, we find the overlaying of the stucco and coloured decoration has to a certain extent hidden the structure itself; and beautiful as this overlaying certainly is, and perfectly as it has been made to harmonise with all of structure which is allowed to remain visible, it generally, to my eye at least, obscures too much. In earlier works, both of the Arabs and Moors, a principle of simple masonic construction is always indicated, and the stone is never overlaid by the plaster, nor is the eye misled by the inlays into confusion as to the system of jointing. In thus dwelling upon the beauty of Arabian masonry, I would not be understood for a moment as depreciating the plaster-work (as such) of the whole range of Mahommedan design, from the days of Ebn Tooloun to those of Boabdil el Chico, since during all the many centuries intervening between the reigns of those sovereigns we find, in stucco, admirable hand-worked patterns, executed with a precision and force at least equal to those we meet with in the works of ancient Rome itself. There is one more aspect under which this subject is interesting to us. In the present day there exists on all hands great desire for novelty in the main features of design, as well as in the decoration of buildings. I believe that legitimate novelty in this direction is not to be obtained by a mixing up of styles, or by confusing them together; it is rather to be found in the development in new directions of technical arts, which, if they have not already done so, may in the future be made to minister to the operations of building and decorating. It was by "developing" in this direction that the Arabians found strength, novelty, and completeness of style, and as they did, so may we do. When I look at their tiles, I see one direction at least in which we have been for some time so following an Oriental lead, and I note in them a very legitimate and excellent form of decoration, calculated, I think, to effect a great change in the aspect both of our exterior and interior architecture. I know it has, to some extent, done so already, and I believe it will do so yet more. I see also in this variety of Arabian woodwork, involving an apparently very intricate, though really simple, combination of different patterns, nothing which any skilled workman with the least desire to do what has been so well done, and what seems so thoroughly congenial with a just idea of good joiner's work, would not be able to do perfectly in this country at the present day. When one looks at the rude materials and processes by which elaborate and beautiful works were carried out in almost every technical art by the Arabians, it is difficult to imagine why the same good work should not be designed by us architects, and wrought by our artificers, who should learn to take a pride in their calling, and be honoured in proportion to their merit in it, as the Arabian workmen were. All that is wanting is that the same simple taste, good judgment, and technical energy should be bestowed upon our designs and upon our works. Men are yet to be found in India and Persia, in Cairo, and even in Spain, who, in some degree, retain the theory and practice of the most ancient Arabian tradition. I myself saw in Granada, only a few months ago, a man working with a lathe of the kind described by Mr. Crace; the only difference was, that the lathe I saw consisted of a long iron bar, with "gudgeons" sliding on it, and capable of being fixed by screws at any distance apart. Between these gudgeons a piece of wood was so held as to be capable of gyration, with the least possible amount of friction. The workman sat down with this in front of him, and kept it working with a bow, similar to that constantly used by Indian turners, which twirled the wood round rapidly on the iron gudgeons. This he did with his left hand, while with the right hand he steadied himself, changed his cutting tools, and measured from time to time the gauge of the work he was doing. For what right hands usually do with ordinary lathes, he substituted his right foot, which exhibited an elongated great toe just like a thumb, and a metatarsal development such as I never saw before. He held the chisel tightly between the great and second toe, and seemed to use his foot just as easily as we ordinarily use our hands. It was curious to find at Granada such a retention of the simple machinery and method by which it is probable that the Moors executed the bulk of their larger ornamentations in wood, dependent upon the lathe for the fashioning of their leading forms. I trust I may be permitted to allude to one more point before I sit down; and that is, the opportunity for surface decoration which was afforded by the large wall surfaces in which the Orientals have always delighted, and by their simple arch soffits and vaults, rarely cut up by moulded work or chamferings. I cannot help thinking that these remarkable "reversible" patterns which we see here, and the effect of which is invariably excellent, were probably originally due to the desire to economise labour and cost, by making one piece of material serve, by counterchanging and interchanging the parts into which it was cut, to produce patterns in different coloured materials without the waste of any portion of material. At the same time I cannot but consider that, speaking theoretically, patterns so formed appear to be in strict compliance with that which was, and should be always felt to be, a bounden duty to carry out in coloured decoration, viz., equalisation of superficial areas of contrasting colours in the design of patterns intended to convey a sense of tranquil beauty. The principle was no less important when the contrast was intended to be effected by *chiaroscuro* only or by variety of materials than it was when the effect was intended to be produced by contrasting colours. Equalisation was demanded of the light and dark shades. It is such regular balance which keeps ornamentation quiet, and which gives to it its dominant aspect of repose. Balance, it should always be remembered, is just as essential to repose in decoration, as equilibrium is to security, and its appearance to a sense of security, in structure.

MODERATION IN RESTORATION.

SIR,—A variety of thoughts, hopes, and aspirations were engendered, upon a recent visit I paid to some of our cathedrals: there were more than one very old friend among them, friends whose aspects I had hoped never to see changed for the worse, friends who had always seemed to greet me with the same old look of confidence and close intimacy, and in whose embrace I forgot the busy whirl of the present, and betook me to the days when the care of the hour was quite sufficient to fill the whole of my thoughts, and the chance of a broken neck from a parapet or a broken head from a verger was not fearful enough to prevent certain visits and expeditions which I and other bold spirits used to pay to the sacred fanes.

Alas! that such things are necessary; but these old sentinels of religion seem one and all to have become imbued with the celebrity of the wonderful power of Madame Rachel; they seem to believe that their charms have departed, and that their strength has failed. They have held a chapter, they have put resolutions, they have carried exemplary amendments, and they have demeaned themselves in a most extraordinary manner. Stormy discussions have taken place, fiery words have been uttered, wisdom has been disentombed and reinterred, and the great point has been carried. One fine old fellow, who seemed as firm on his pins as ever, drew attention to his teeth: alas! they had been drawn, his articulation was indistinct, and the food which he took did neither credit to the donors nor good to himself, and the symmetry of his portals had vanished. Another ancient and honoured individual pointed to his eyes; they had gone out, those orbs whose brilliant glories had once flashed all the colours of the rainbow over all who came within their influence, were represented by empty sockets; and so one after another drew

attention to his failings, and the heralds were commanded to proclaim that SS. Peter, James, John, Andrew, Michael, Nicholas, Bartholomew, &c., were about to be made beautiful for ever (?).

This Rachelian process has now been going on for a sufficient length of time to enable one to judge of its success in nearly all instances. Is the judgment upon all counts in favour of the enamelling, renewing, exchanging, reversing, perpetuating, restoring process?—who will say. But where a professor commences operations without well-defined rules for his guidance, it will not be difficult to predict failure somewhere. Now, however perky my old friends may look, glorying in their scraped faces, brilliant glass eyes, renovated months, restored joints, and new skin generally, many of them have lost that solidity of character, that majestic presence, which at once charmed and awed the beholder. May we hope that these attributes may at some future time return, and that all spirit, all fire, has not been improved and restored out of them. The first old friend that I came across, was Gloucester Cathedral. I had paid periodical visits, had before marked the commencement of some processes, the completion of others, and had looked forward with some amount of dread to the continuance of the doctoring. I had noted the glorious south aisle, with its rich decorated windows, with their unusual and exquisite tracery, and their profusion of ball flowers, the massive and noble buttresses which flanked the wall, and exhibited in their fertility of design the hand and eye of the master. These windows and buttresses are without parallel,—were, I had almost said. Some years ago, the wall, which had been pushed out by the groining, leant over dangerously; something was absolutely necessary to be done, and it was done. The inside face of the wall was made perpendicular, the windows were restored, and now the buttresses are undergoing the same process.

In reproducing, say, the moulded jamb of a window, the great point is to obtain a profile of the mouldings as they left the workman's hands four or five hundred years ago; not their present profile, for naturally the effect of time has been to alter the original form considerably. The most projecting portions being more exposed to all the storms of heaven, will have been worn away greatly, whereas the hollows with the protection of these very mouldings, will have suffered little or nothing; indeed, I have often found that instead of being deeper, the dust of ages from the exposed parts of the same jamb, as well as from the ground and surrounding objects, has formed a hard coat of some thickness, made the hollow smaller, and thus materially aided in the flattening process. The new portion of jamb, when fixed in its place, would exhibit two peculiarities: the projecting members would come beyond the face of the old; the hollows would recede behind it. This is all so natural, that I may be told to teach a female progenitor of mine how to extract the meat from an egg; but when I see the principle of restorations so often ignored, I think I am not wrong in inviting attention to it. Should a richly-moulded doorway have to undergo in the course of time, say half a dozen restorations, the sixth would triumphantly end, in all probability, in a bald splay, had care in obtaining the original profile been neglected, and simply a mending or joining of the old performed. Careful supervision of each stone should be the rule, and a clerk of the works appointed who would inflexibly reject every stone not coming up to a perfect standard. I say this because I have found, however willing a builder may be to have genuine work done, however clear and correct an architect's instructions may be, men will take every opportunity of going wrong, and making an even face, arguing that their work looks better.

In connexion with the work at Gloucester, I may mention one thing which may interest church restorers: a similar point has been discussed in the pages of the *Builder*. The windows between the porch and transept, as I before said, are rare specimens of decorated work, with one exception, and that is the seventh or easternmost one. Here portions of the original three-light decorated window have been worked up into a wretched Perpendicular insertion of four lights. When the repairs were started, I believe the dean and chapter and the architect determined to replace the decorated work. A gentleman obtained permission to fill this with stained glass; templets were made, and a costly and successful window produced in Munich, by Chevalier Max Ainmüller, but a change of deans or architects taking place in the mean time, it was discovered that the condemned insertion was a fact. The cripple is to be patched; and, awaiting a permanent habitation, the glass can be seen at the Gloucester School of Art: it well repays study, is superior to German glass generally, and the correctness of the architectural adjuncts is as praiseworthy as the masterly drawing and harmonious colour.

The interior and exterior of the choir were crowded with scaffolding and workmen, and the services had to be held in the grand old nave, where much praiseworthy work has been done simply in clearing; it has been more than once described in the *Builder*, who seems to have an eye for everything. May it still continue to keep a tight rein upon restorers, and to check sometimes the too great enthusiasm of building chapters.

M. U.

EMIGRATION.

ACCORDING to newspaper reports, the country is in a state of great agitation and excitement on the subject of emigration; and having travelled a little abroad myself, and visited many of our colonies, I shall be glad if you will allow me the opportunity of making a few observations on the subject. The movement is a matter of grave import, and one attended with serious consequences to this country, to the intended emigrant, and the colonies; and therefore should be well considered.

There is, doubtless, a fine field for extensive emigration in many of our colonies, to bring into cultivation the vast extent of uncultivated land that exists there; but the class of persons to be sent out should be those well accustomed to agricultural operations, or who possess the physical ability and aptitude to acquire such knowledge quickly when taught the respective modes of cultivation adapted to their particular produce. On my recent return from Honduras I was brought into contact with several American families, who were returning from that colony to the United States, whence they had emigrated during the war, or at the termination of it, and, though brought up as agriculturists in the States, they failed to carry out the cultivation of tropical produce, perhaps from the want of capital: they had sunk their little all in the colony, and were returning to their native land dejected, threadbare, and penniless.

Although that colony has a very extensive tract of uncultivated land, and is covered with bush, no encouragement was afforded them in their pursuits, no effort was made to keep them in the country, or inducement held out for them to remain; and so it will be with any emigrants we may send out, unless they are specially adapted to the wants of the colonies, or possess a sufficient amount of capital to embark in agricultural operations on their own account, or are assisted with money by capitalists until they have acquired a thorough knowledge of the country, its climate, and proper mode of the cultivation of the produce; and that knowledge will require some time to acquire,—say two or three years,—until they are thoroughly established.

Most of the uncultivated land in our colonies is covered with forest and bush, and the trees are of such magnitude, and the forest and bush so thick and dense, that they would astonish the people of this thinly-timbered country. They would require advice and assistance as to the best method of clearing and preparing the land, which none but men experienced in such works or backwoodsmen would understand. Of course they would be supplied with and take out with them all the necessary tools, implements, &c., required for agriculture, building, and other operations, because they are not always to be obtained there, or of the best kind; but if they can be procured there they are generally at an exorbitant price.

In the expeditions I have been connected with, I have always taken out every tool, implement, &c., required for my operations; not relying at all upon the resources of the country, but preparing myself for any and every emergency.

But, although tendering this advice on the subject of emigration, I by no means approve of the movement on the extensive scale contemplated, particularly if we send out those that our colonies require, who are just the class of persons who can be ill spared from home, as I shall endeavour to show. Have we no waste lands in Great Britain that are capable of cultivation, which would well repay the outlay of the employment of these people? Have we no public works, railways, or tramways required in this country to extend and complete our system, so as to facilitate commerce, and add to the wealth of the country, on such a plan as would well repay the cost? Are there no sea embankments required to protect our coast in various places; or is our territory to be left to the mercies of the wild wind and waves, because we are not, as poets allege, "an iron-bound coast" everywhere? Is all our land in the best state of cultivation possible? Is science invoked everywhere, and the earth not capable of producing another blade of corn? Is no draining or irrigation required, so as to produce hereafter heavier and better crops? Or are we to pay away millions sterling annually for that which produces the staff of life, and which we might grow to a great extent at home? Are all our rivers in the best possible order for navigation and the drainage of the country of its pure water? Are our town improvement works in that happy state of forwardness as to need no further employment of labour, so as to properly dispose of our town sewage, and not to pollute our beautiful rivers; and thus to get rid of one of the causes of pestilence in the country, and to render the delightful shelving banks of our rivers habitable? Are our water-works completed everywhere? Do we not require an extensive series of reservoirs on all our rivers, so as to conserve the rainfall in wet seasons that would yield a supply of water through all dry seasons, even the driest known, for the growing necessities of the population and for agriculture? Remember 1868, its dry season and scarcity of water. Or are we to be hereafter as reckless with our rainfall as we appear to be with the bone and sinews of the country?

Since the introduction of railways, are not our public roads a disgrace to us? We are drifting into that state of normal difficulties of transit of a century or so back that drew from obscurity the talents of a McAdam and a Telford to mend our ways, and to force on civilisation whether we would or no. Look at our roads, urban and suburban!—on this picture and on that. Who can answer these questions satisfactorily? And what a glorious field is there for the Government, the capitalist, and the wealthy philanthropist. We are sending out our useful population and scattering them before the four winds of heaven to do that in our colonies, and for foreigners, which we urgently require at home. Let us put our house in order before we think of our neighbours, and let us take up many of the important measures I have suggested above, and thus profitably employ capital at home, and at the same time afford employment to an orderly and a contented people, even with the bitter dregs of poverty, and thus add materially to the *prestige* of the Anglo-Saxon, the national honour, and the strength and welfare of the country.

But if there should be any doubt on the subject, let a Commission of eminent philanthropists and engineers be appointed to chalk out a course for the Government, the Legislature, and the country. Surely some such step is as necessary in this emergency as the expenditure of millions sterling during the Irish famine, or of twenty millions sterling to abolish slavery in our colonies, and to release men from a servitude under which they enjoyed privileges which but few of our working classes possess, and which had the effect of literally ruining an important part of her Majesty's possessions. I have no hesitation in saying that if, instead of embarking such large sums of money in foreign loans, to aid, as alleged, foreign works, or possibly to strengthen an enemy and find him sinews of war the better to cope with us in the field, the money were spent in useful works at home we should hear little of distress or of want of employment. All that is required is that those who by good fortune have amassed wealth from social position or success in trade and commerce, should well consider philosophically that they hold it in trust for the good of the community at large; that money is useless unless it is speculated with, circulated, and distributed in such a way that will confer the greatest benefit and happiness on the greatest numbers.

If the Government and those humane and able men who are now doing all they can to promote emigration would endeavour to introduce and stimulate some of the various schemes I have shadowed forth, they would confer vastly greater benefit on this country than by raising hundreds of thousands of pounds, and freighting ships with perhaps unwilling cargoes to seek fresh homes and fields and pastures new; and the intending emigrants, and many thousands besides, now on the verge of

pauperism, would hail them as noble regenerators of their country's welfare, the worthy saviours of their hearths and homes, and brave peers of England, pillars of the State. It is not the way to meet the cry of the distress and anguish too prevalent in this country, and to clear the streets of the reeking misery occasioned by the want of work, by closing up the public dockyards and other establishments, or by corporations—Liverpool for instance—suspending sanitary and improvement works for the sake of saving a petty rate or two; for these are times, of all others, when every encouragement and assistance should be given to the helpless masses to tide over this great national calamity, until better times dawn, and until the Government, our great capitalists, men of wealth, and well-to-do, soften and relent a little, and, by putting their shoulders to the wheel, set in motion that machine which alone could spread comfort and happiness through the country, in the full tide of employment for willing hearts and hands, that a liberal embarkation of capital would produce, in useful undertakings, throughout the length and breadth of this small proportion of her Majesty's vast dominions.

I fear I have trespassed at too great length on your valuable space; but the questions raised are important ones, and cannot be too strongly and forcibly impressed on the minds of your readers and those able and willing to lend a helping hand to mitigate the heavy calamity that now weighs upon the vital energies of our common country.

B. BAYLIS.

THE BELGIAN STATE RAILWAYS AND TELEGRAPHS.

A PAPER on the passenger traffic of the State railways in Belgium, with remarks on the telegraphic system, by M. Corr-Vander Maeren, was read and discussed at the last meeting of the Social Science Association. From the statistics quoted in this paper, it appears that the total of the lines in working at the beginning of 1869, in Belgium, was in length 2,730 kilomètres, or 546 leagues (about 1,640 English miles), divided as follows:—

	Kilomètres.
Worked by the State	862
Worked by companies	1,868
Together	2,730

The amount of the capital which the Government had expended for the construction of railways up to January 1, 1868, was together 262½ millions of francs (about 10½ millions of English pounds sterling).

The cost of construction of the State railways amounts to 409,647 francs (about 16,400*l.*) per kilomètre (or five-eighths of an English mile), divided as follows:—

	Francs.
Railway (the cost of the lines)	236,424
Buildings, stations, &c.	67,763
General expenses	8,665
Rolling stock	96,795
Total cost per kilomètre	409,647

Or at a cost of 26,200*l.* per English mile.

The general result of the working for the year 1858 is as follows:—

	Francs.
Total receipts	38,318,509
Total working expenses	24,826,964
Surplus	13,491,545

Or about 540,000*l.*

These 13½ millions of francs profit upon the workings of 1868 give 5½ per cent. upon the whole capital expended upon the railways (say upon 262½ millions of francs).

These figures show that the railways, which have done so much for the country, both in a political and economic point of view, have not only been self-sustaining, but that their general pecuniary result is a profit since their origin of nearly 57,000,000 francs, about 2,280,000*l.*, including interest on loans, sinking-fund, and all incidental expenses.

The lowest rates of tariff have been found to be the most productive. The differential fares introduced by the decree of the 20th March, 1866, and now operative, instead of the *fixed* rates of 8, 6, and 4 centimes per kilometre, substituted upon the bases of those rates a system of reduction, decreasing the rates with increased distances. The fares, however, are not so low as they once were, neither are they so profitable. The telegraph in Belgium is, like the post-office and the principal lines of railway, worked by the Government under the direction of the Minister of Public Works. The tariff established by the State at the onset was calculated, by dividing the country into three radii, zones, or different distances, fixing the rates respectively at 2f. 50c., and 5f., and 7f. 50c. for twenty words (2s., 4s., and 6s.)

As the use of the telegraph increased, the tariff was reduced time after time, until the 1st of December, 1865, when the uniform rate of 50 centimes (about 5d.) for the whole of the country was introduced and carried out with great vigour and success. Previously to the 1st of December, 1865, the rate for simple telegrams of twenty words was 1 franc. This was for telegrams of the interior of Belgium.

The telegraph in Belgium has long since completely paid off the entire expenses of its first establishment. Beyond that it shows, on the 1st January, 1869, in the general account, a net profit of about 700,000 francs (28,000*l.*).

"FEATHERS" IN MAHOGANY AND OTHER WOODS.

WE have been asked by a correspondent for an explanation of the so-called "feathers" in the grain of mahogany, satin-wood, &c.: thinking other of our readers who have to do with woods may be interested in the subject, we offer the following explanation:—

In the structure of all woods used in building, there is, firstly, a series of vessels of woody tissue surrounding the heart of the tree, having a *vertical* growth, and arranged in *annual concentric circles;* secondly, there are certain hard woody growths, called the "medullary rays," *radiating* from the heart, and consequently more or less *horizontal:* these vertical and horizontal growths are intimately but *regularly platted and intertwined together*, to give strength to the trunk, and thus far all is regularity. Now, where the branches burst through the stem, this regular arrangement is upset, and the above-mentioned woody vessels are disarranged, and pushed at different angles. When the tree is cut down and sawn horizontally across amongst these branches, these disrupted horizontal and vertical vessels (of different colours, be it remembered), are seen cut at every conceivable angle, and an ornamental "feather," more or less extensive, is the consequence. These feathers do not exist at the *base* of the tree, because there are no branches there to disturb the annual growths of the wood (minute feathers do indeed exist at the *very heart*, and these were caused by the growth of leaves and twigs when the tree was a seedling or little cutting). "Feathers" are not seen in *deal* because the fir is a straight-growing tree, without branches, in the portion of the trunk used in commerce. "Feathers" are seen most abundantly in "pollards," for the simple reason that after the top of the tree has been sawn off, an immense growth of branches is always induced disturbing the tissues in every imaginable way: the action of the *light* on the "feathers," adds greatly to their beauty after the wood is polished.

MILK.

A LARGE establishment has just been completed in the Moscow-road, Bayswater, for the Aylesbury Dairy Company, Limited, which deserves a passing notice, from some peculiar features in its arrangements and construction. The business of the company is the delivery of pure country milk day by day throughout the London districts; and when we say that already it supplies daily 1,400 families, entailing the necessity of making more than 20,000 visits per week, it is evident that some peculiar arrangements are required. The objects of the company speak for themselves. London milk has long been a proverb, and the mere fact of a responsible body of respectable men guaranteeing the character of the article delivered, and inviting any and every test of their sincerity, is of itself a great advance, in a commercial point of view.

The company was established about four years ago, on a small scale, deriving their supply at that time only from the district of Aylesbury; but since then they have extended their operations into Bucks, Berks, Wilts, and Oxfordshire, and are not dependent on any one particular line of railway for supply.

The establishment in Moscow-road is about 100 ft. wide by 130 ft. deep, and is occupied exclusively for the purposes of the company and their *employés*, all of whom, about forty in number, reside upon their premises. The early and late hours required (five in the morning, all the year round, up to twelve at night for the men attending the late trains), render this a *sine quâ non*.

A large area, partly covered with glass, occupies the centre of the space, where the loading and unloading of the vans is carried on at a platform 100 ft. in length; and around this are disposed, in various floors, dwellings for the men, a house for the foreman, a residence for the secretary, accommodation for the clerks (in this case young ladies) residing on the premises, a very complete set of offices for the transaction of business, stabling for twenty horses, and accommodation for the vans, as they are called, but which are, in fact, light carts on two or four wheels, drawn by one fast-trotting horse, and more resembling a dog-cart than a van. The basement is arranged for the storeage of the milk, and a very capital reading-room for the men forms part of the establishment, which has thus a curiously domestic character, though so extensive in its operations.

The buildings have cost more than 6,000*l.*, and have been carried out from the designs of the late Mr. Williams, of Montague-street, Russell-square, by Mr. Conder, the contractor, under the supervision of Mr. G. Taylor, Mr. Williams's successor. Fireproof floors, both of Dennett's and Phillips's construction, are partially introduced.

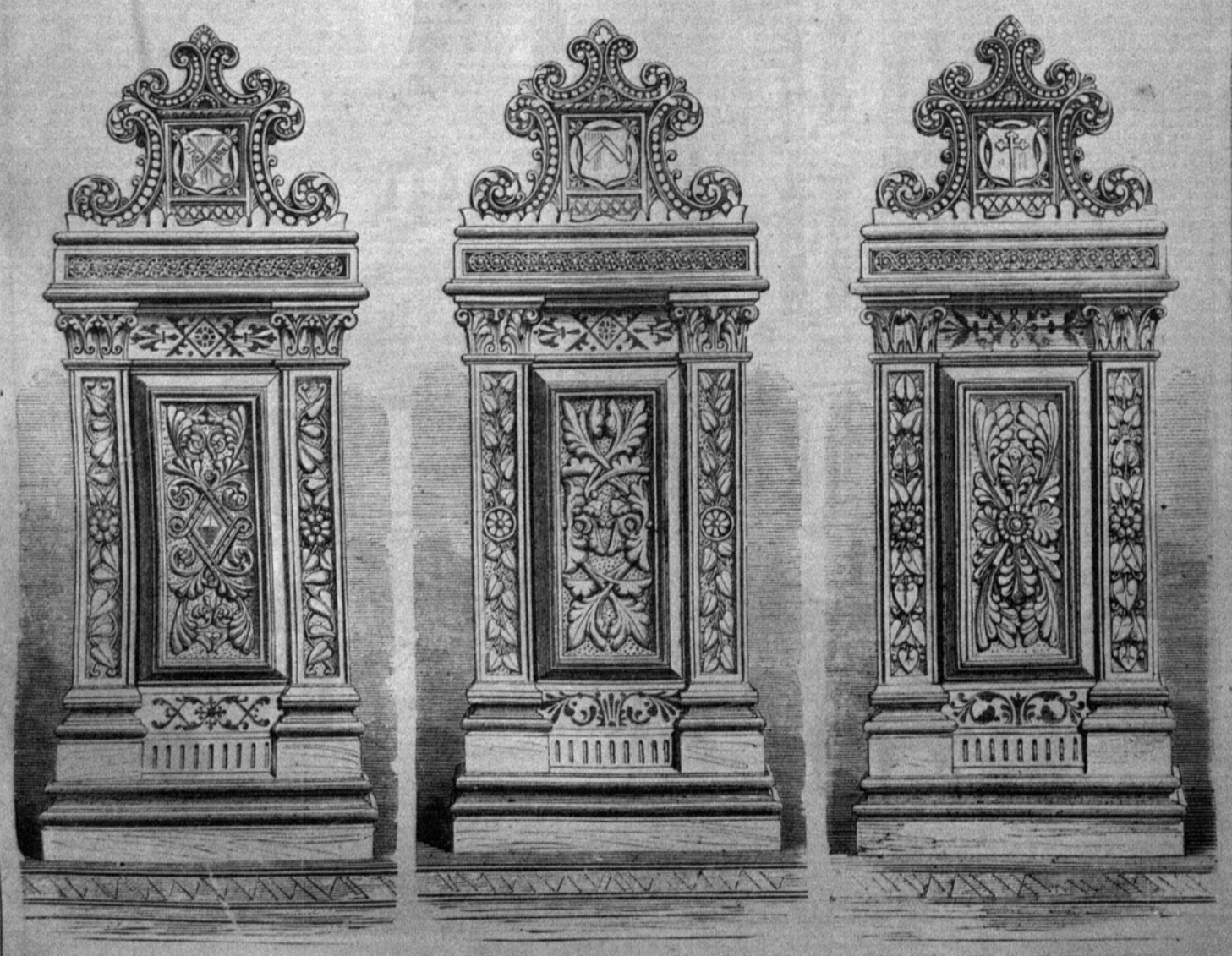
The building will be open for public inspection from the 19th to the 26th inst.

WORKMEN IN NEW YORK.

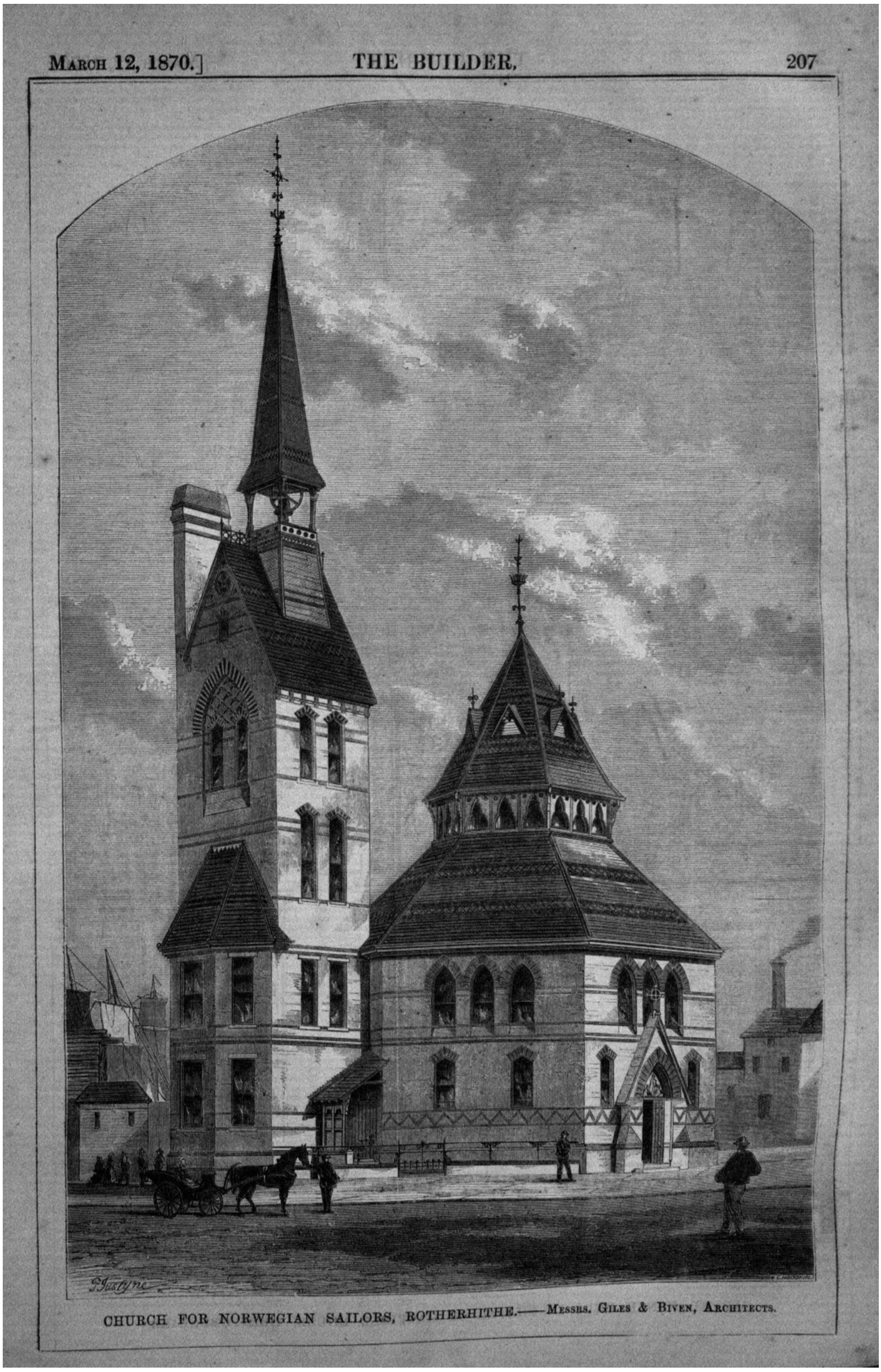
"THOMAS CONNOLLY," Stonemason," has addressed another letter to the *Daily Telegraph*, wherein he says:—The weather has been extremely fine and open here since I landed—much finer weather than I ever experienced in England at the same time of the year; yet most of the works have been stopped these two or three months past, and fully 30 per cent. of the working population are now unemployed, and will, in all probability, so remain until April or May. Still, in my opinion, they manage to get through the winter better than the unemployed in London, owing, in a great measure, to the bountiful resources of the country. The season just passed is considered to have been one of the best since the close of the war, especially for those engaged in the erection of buildings—which, by the way, they do in a different manner from that common in England. The brick fronts are all put up after the other walls of the house have been built, and are usually surmounted by a cornice made of zinc. The roofs are flat, covered with tin plates; and most of the stone fronts are merely a veneer 4 in. thick, tied into the brickwork with iron clamps. Labourers get from 1½ dol. to 2·75 dols. per day of ten hours; builders or wallers receive 5 dols. for ten hours; bricklayers, 5 dols. a day of ten hours; but the men who lay the front bricks, usually by the piece, earn as much as 7 dols. a day. Plasterers get 4½ dols. for eight hours, the number they work per day. Joiners have 3½ dols. to 4 dols. for ten hours; a great deal of the woodwork is done by machinery, and their principal task is to put it together and fix it. The carpenters' work, or framing, is done by Dutchmen—as all Germans are called here—at about 3 dols. a day. Painters get 4 dols. a day of ten hours in the summer, and 3½ dols. in winter. The stones generally employed here are granite, from Maine; a chocolate-coloured sandstone from Connecticut and Jersey; a fine-grained drab-coloured sandstone, from Ohio and New Brunswick; and a bastard white marble, raised at Tuckahoe, about fifteen or twenty miles from New York. Those stones cost about 1½ dol. a cubic foot. The stone-cutters, when employed by the day, receive 5 dols. for eight hours; but a great deal of their work is done by the piece, according to a book of prices agreed on by the employers and the men. If a man can earn his wages, or more, he is set to work by the day; if not, he has to work by the piece, and earn what he can. Owing to the high price of materials, builders dispense with stone as much as possible, and construct the fronts of warehouses and many other large buildings of cast-iron, at one-half the cost of stone. These iron fronts are well designed, in every style of architecture, and are painted to imitate white marble. I have invariably found, that when a trade assumes the character and dimensions of an industry, the men are not better paid than in England; in fact, sometimes less, when the purchasing power of the money is taken into account.

MR. A. J. BERESFORD HOPE, M.P.

Past President of the Royal Institute of British Architects.



CARVED BENCH ENDS IN CHAPEL OF HATFIELD HOUSE, HERTFORDSHIRE.



CHURCH FOR NORWEGIAN SAILORS, ROTHERHITHE.—MESSRS. GILES & BIVEN, ARCHITECTS.